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ABSTRACT

The Intellectually Gifted/Learning Disabled Project investigated characteristics of this population and implications for educational programming. Twenty-three children, aged 7 to 16 years old, were identified through a referral process involving schools and parents. Only two subjects were female. A detailed analysis of school records; individual assessments of cognitive, affective, and language abilities; and parent interviews were utilized. An instructional component was designed to provide an appropriate and motivating educational program focusing on computer education; affective development; and a study of the brain, learning, and behavior. Among conclusions of the project were the following: that most schools identified students who were underachieving gifted children rather than learning disabled students (who would be expected to exhibit verbal-performance scale discrepancies and large amounts of subtest scatter); that successful learning disabled gifted individuals overcome their deficits by compensating with strengths; and that learning disabled gifted children may "alter the processing" of information by developing strategies using preferred performance modes. Among eight recommendations were the following: evaluate strengths and weaknesses in information processing; assist the development of metacognitive strategies; teach students to compensate for weaknesses by using strengths; develop higher order problem solving and information processing skills. (DB)

Intellectually Gifted Learning Disabled Students:

A Special Study

Susan J. Hansford
Joanne R. Whitmore
Audrey R. Kraynak
Nancy G. Wingenbach

Kent State University



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Preface

The Intellectually Gifted/Learning Disabled (IGLD) Project conducted in June and July of 1984 at Kent State University in Kent, Ohio, was an exploratory project investigating the nature of learning-disabled gifted children. Using the landmark book, Learning-Disabled/Gifted Children: Identification and Programming (Fox, Brody, & Tobin, 1983) as a springboard for ideas, the IGLD Project sought to investigate the characteristics of learning-disabled gifted children and to examine the implications of those characteristics for educational programming.

The authors would like to acknowledge the support of Kent State University and its faculty members who provided input into the development of this exploratory project. The authors would also like to acknowledge the efforts and dedication of the Project Coordinator, Dr. Nancy Wingenbach, and the Project staff: Marianne Dove, Kathy Frazier, Susan Hansford, Dr. Gladys Knott, Ann Lauderdale, Audrey Kraynak, Jeanine Lightel, Julie Shuman, Nancy Sweeney, and Dr. Joanne Whitmore.

Sections of this monograph were contributed by IGLD Project staff members who were responsible for those specific components of the Project. We especially acknowledge the authors of the following sections: analysis of the K-ABC, Jeanine Lightel; analysis of the DTLA, SPM, and CFIT, Audrey Kraynak; instructional component - computer education, Nancy

Wingenbach; instructional component - study of the brain, learning, and behavior, Julie Shuman; instructional component - relaxation room, Kathy Frazier.

The purpose of the Project was to suggest questions and directions for educators and researchers involved with this unique population of children. The monograph has been organized around the components of the IGLD Project, describing Project efforts in identification and instruction, analyzing and summarizing results, and offering recommendations based on our experiences.

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The Problem

The idea of a child who might be both learning disabled and gifted is relatively new. Does such a child exist? If so, what are the characteristics and behaviors we might use to identify him/her? Can available assessment instruments provide useful information? How can we best provide an appropriate education for this child? An exploratory project was conducted at Kent State University in Kent, Ohio during the summer of 1984 to investigate the phenomenon of the intellectually gifted/learning disabled child and to seek answers to these questions.

Literature in the field of learning-disabled gifted children is spotty and of uneven quality. There is little empirical research data available; most of the literature is based on case studies (sometimes only of one child) and opinion. Authors frequently cite as references other articles of questionable value and content. However, there is some good thinking being done in the field--Maker (1977); Whitmore (1980); Schiff, Kaufman, and Kaufman (1981). The most significant contribution to the field has been the University Park Press book, Learning-Disabled/Gifted Children: Identification and Programming edited by Fox, Brody, and Tobin (1983) which describes recent research and experimental programming efforts.

As this is a new field there is a limited body of knowledge or research on which to draw. Much of the literature seems to be summations of general knowledge about either gifted

children or children with learning disabilities that have each been generalized to include the other. Frequently it seems that the reader could eliminate the term "gifted" from the article and have remaining a good discussion of learning disabilities or eliminate the term "learning disabilities" to have a good article about gifted children. There is very little being said that synthesizes the two fields together and deals with learning-disabled gifted children as an independent, special phenomenon. Perhaps that fact is an indication that learning-disabled gifted children are not being perceived as a particularly unique phenomenon but rather as a subset of either the learning disabled or gifted populations. The Kent State University project was designed to investigate this question also.

In analyzing the fields of learning disabilities and gifted, there are many parallels which cause difficulty for persons investigating the nature of the learning disabled gifted child:

1. Problems of definition

There is much controversy and disagreement in both the field of learning disabilities and the field of gifted regarding definitions of both exceptionalities. Depending upon one's choice of authors or theorists, one could find virtually opposing definitions for either learning disabilities

or gifted. There are definitions of both which would unquestionably disallow the possibility of a child being learning-disabled gifted. Investigation into the phenomenon of learning-disabled gifted is hampered by the search for more precise and accurate definitions in both fields.

2. Problems of awareness

Both the fields of learning disabilities and gifted education suffer from a lack of informed awareness on the part of the public and school personnel. The need for special education for children with learning disabilities is, perhaps, slightly better understood than the educational needs of gifted students; however, educators generally do not understand the specific characteristics of learning disabled children much better than those of gifted children. For the most part there is more sympathy for the learning disabled child, which may lend itself to a greater degree of tolerance and understanding; the gifted child does not share in that sympathy. A child who exhibits learning disability behaviors, yet whose general intellectual ability is obviously far above average, is an anomaly unlikely to be recognized or understood.

3. Problems of a socio-political nature

The problems of a socio-political nature in both fields are tied heavily to issues of definitions and funding practices. Theoretical definitions which were never intended to be operational definitions have been operationalized to conform to political expectations for special funding. The field of gifted child education, especially, is subject to continually changing socio-political interests and needs.

4. Problems of identification

The status of assessment instruments and practices is continually coming under scrutiny and criticism by persons outside the field of education as well as by persons within the field. Psychological testing and the resulting "labeling" of children is aversive to many. In efforts to further operationalize definitions of learning disabilities and giftedness, assessment instruments are analyzed and developed, sometimes modified or revised. The belief that if something exists it can be measured pervades all of special education, despite the recognized limitations of assessment instruments.

5. Problems of programming

Providing appropriate instruction for learning disabled children has been somewhat encouraged by

Public Law 94-142. The concept of the least restrictive alternative for educational placement of a learning disabled child has opened some previously closed options for those children. Unfortunately, P.L. 94-142 has too frequently been interpreted to mean the same approach to the least restrictive alternative for all learning disabled children regardless of individual needs. The same is true for gifted children--all gifted children in a given school district usually receive the same programming regardless of specific needs. Thus, specific needs and characteristics of individual children are frequently unrecognized and unmet.

Background and Design of the IGLD Project

The motivation for designing the Intellectually Gifted/Learning Disabled (IGLD) Project was directly related to the ambiguities and questions associated with definitions and identification procedures for children recognized by school personnel as possibly both learning disabled and intellectually gifted. Because of her expertise in the area of underachievement among gifted children, Dr. Joanne Rand Whitmore, Assistant Dean for Teacher Education at Kent State University, had received numerous requests from parents and schools for assistance with children described as "LD/Gifted." As Dr. Whitmore worked with these children, their parents, and

schools, she found that frequently those children described as learning-disabled gifted seemed to be actually underachieving gifted children with no apparent specific learning disabilities. As a result of her interest in these children (both underachieving gifted and learning-disabled gifted), Dr. Whitmore began investigating ways to study this population. The impetus for an exploratory project was provided when several doctoral students with expertise and interest in both gifted and learning disabled children expressed similar interests and willingness to work on a summer project with Dr. Whitmore.

Co-directors of the Project were Dr. Whitmore and Dr. Gladys Knott, also a member of the Special Education faculty at Kent State University, whose expertise is in the area of learning disabilities. The Project Coordinator, Dr. Nancy Wingenbach, was a Kent State University graduate with doctoral level expertise in gifted and learning disabilities as well as reading. The assessment and instructional staff, all graduate students at Kent State University, was composed of three certificated school psychologists and four experienced teachers, all with background and interest in gifted child education.

The Kent State Intellectually Gifted/Learning Disabled (IGLD) Project staff designed the project based on the foundation established in the 1983 landmark text edited by Fox, et al. The Project was structured around two basic components: an assessment component to ascertain the children's abilities

and areas of disability, and an instructional component to explore the effectiveness of various instructional strategies for these children. The assessment phase of the IGLD Project was preliminary to the instructional phase. Twenty-three students participated for one day in the assessment phase which was completed over a two week period; eleven of those students continued with the Project for the three week instructional phase. Assessment and evaluation was ongoing for those students participating in the instructional phase and provided valuable additional information regarding the nature and characteristics of the children.

The Involvement of Schools in the IGLD Project

In February, 1984, school officials in the local school districts surrounding Kent State University were informed of the tentative plans for a project to study the characteristics of students classified as learning-disabled gifted. School officials were invited to indicate the numbers of students in their districts who had been identified by school psychologists or special education personnel as learning disabled but who also exhibited characteristics of intellectual giftedness. Districts also were asked for suggestions as to how such a project might best serve the needs of such children, their families, teachers, and school systems. Responses to this initial survey were extremely positive, indicating a definite need for the proposed

Project. Informational packets containing a description of the Project and an application form then were sent to the schools for distribution to the parents of children identified by school officials.

The school districts responded in several different ways to the invitation of the IGLD staff to refer students for potential participation. One nearby district mailed letters regarding the Project to the parents of gifted students who were currently receiving learning disabilities tutoring or resource room services. Parents residing in another district learned of the Project from their child's regular classroom teacher. In a third district, the school administrator was concerned that referring children to this summer program would constitute a form of identification, thereby obligating the district to provide a differentiated program, or two forms of special educational services for certain children. Nevertheless, after consultation with a Project director, two elementary age children were referred to the Project by one of the district's school psychologists. Parents in other school districts learned of the Project in various ways through informal school and community contacts and indicated to the Project Coordinator an interest in applying.

The application (Assessment Information Form, Appendix A) included a section for reporting the results of the child's most current multi-factored evaluation. If the parents did not have

this information (which most did not), they were asked to request the school district to forward the data to the IGLD Project Coordinator. One of the nearby districts, where four of the participants attended school, did not send that information but sent in its place sections of the children's cumulative educational records which included group test scores and classroom grades. Difficulty obtaining complete and appropriate test data was frustrating for the Project staff.

The unexpected degree of variance in the data and assessment information received from cooperating school districts was a major concern of the Project staff. There appeared to be little consistency from district to district and among school psychologists regarding assessment instruments and their use in identifying children as either learning disabled or gifted. Though most of the referred children had been administered the WISC-R, the assessment of achievement and other areas (i.e., social/emotional, visual motor) had been accomplished using a wide variety of measures inconsistently reported to the IGLD Project. Perhaps the districts did not have such information to report; the person completing the form seemingly did not have access to other pertinent information or did not feel it was important to include other data. Regardless of the reason, the diverse and limited amount of data received from schools by the Project staff made cross-group comparisons difficult.

The application form also included sections for observational data about the children, to which most districts responded with at least a few comments about the child. Districts also were asked to indicate test data they would like to receive from the Project staff if the student(s) enrolled in the IGLD program. Additional information was requested only in three cases, and the requests were very general rather than specific.

All parents participated in a group meeting to receive general information about the assessment process and findings. The parent(s) of each child also had a private conference with one of the Project's school psychologists who reported the results of the testing completed on their child in the assessment phase of the Project, and behavioral observations documented by staff members for those completing the instructional phase. The parents also were sent a copy of the Project's written assessment report which contained the information presented to them in the conference.

The parents of six of the children requested that a copy of their child's evaluation report be sent to the home school district. In the fall of 1984, one of the children's school districts requested information about the child's performance in the assessment and instructional phases of the program. The child's performance in the IGLD Project and suggestions for

optimizing his classroom experiences were discussed with that school's psychologist and the child's teachers.

Recommendations Regarding School Involvement

Future researchers investigating this topic should consider these issues and difficulties pertaining to the identification and assessment of intellectually gifted/learning disabled children in schools: (a) the inconsistency of assessment practices and collected test data across and within districts; (b) the unavailability of complete test data for many students; and (c) the reluctance of the districts to release confidential information to the Project staff even with parent permission. These problems were major deterrents to the effectiveness of the Project and the staff's evaluation of the characteristics of participants.

The primary recommendation from the IGLD Project staff regarding similar efforts to use assessment data provided by schools is that the method of data collection be direct. In other words, projects investigating the nature of learning-disabled gifted children should obtain written parental permission for a staff member to go to a child's school to read any available assessment and evaluation reports on file in the cumulative record and, if feasible, to observe the child in various situations and to discuss the child with current and former teachers. Staffing and time implications required for such an approach to data collection may limit its feasibility;

however, the information obtained would be much more useful than that received on simple forms completed by the school.

Parent Involvement in the IGLD Project

As previously described, parents were informed regarding the purpose and nature of the IGLD Project, completed an application form, and gave their child's school permission to release confidential assessment and evaluation information in the school records.

One or both parents brought the student to Kent State University for assessment on the day designated for his/her age group. At that time, a general presentation was made to the parent group which described the exploratory project in greater detail and discussed specific concerns and issues relative to the identification of learning-disabled gifted children, the need to have more accurate knowledge of their characteristics, the specific assessment instruments to be used, and the reporting procedures that would be used to communicate assessment results to the parents and schools.

Following the general presentation of information, parents were scheduled for individual conferences with staff members at which time the Parent Interview Form (Appendix B) was used as a guide for discussion and as a method for recording information provided by the parents. The parent interview data was incorporated into the overall assessment results and interpreted

in conjunction with other input sources to structure a more complete profile of the child's characteristics. Thus, parent input was a component of the formal evaluation process and parent evaluation of the child was included in the final narrative assessment report.

Parents were invited to two evening meetings to discuss the Project's activities, progress and tentative findings. Feedback regarding their child's response to participation in the Project was obtained informally. Parents also gave and received information at a private conference with the IGLD staff psychologist who worked directly with their child. At this conference, the Project's final, formal report on the child was presented for discussion and interpretation.

Parents were an important source of information throughout the Project. They provided background information, gave permission for the release of records, described family relationships and experiences relevant to the purposes of the Project, and described their perception of the learning disabilities and gifted characteristics exhibited by their child. Parents continued the informative dialogue throughout the Project as they questioned (a) the significance of Project findings regarding their child, (b) the reaction of Project staff members to their child in the various assessment and instructional settings, and (c) the nature or structure of this pilot project. In addition to questioning, parents often

validated staff observations of the child while seeking answers from staff members regarding the status, classification and educational placement of their child.

Parents of participants in this Project generally were informed about the learning disabled and/or gifted populations. However, parents had some difficulty comprehending the possibility of both conditions existing within one child and the effects of the combination of conditions on the child. Parents were sensitive to the fact that each child had special and exceptional needs but, on the whole, did not know how these needs could or should affect the child's lifestyle, mental health, socialization, and academic achievement.

Recommendations Regarding Parent Involvement

As parents contributed information regarding their perspective of their child during interviews and meetings, five significant commonalities became evident:

1. Parents needed answers to questions such as, "What does learning disability mean?", "How did my child become this way?", "Where do I go from here as a parent?"
2. Parents expected precise and conclusive information about their children as a result of participation in the Project, yet the nature of the IGLD Project's assessment procedures was such that definitive information was not obtainable.

3. Parents needed more information about the content of tests, the meaning of results, and the value of the Project report content and recommendations than time allowed.
4. Parents reacted favorably to information which confirmed their expectations but reacted negatively to information which did not alter or change the data received from the school. For example, a specific child was not defined by school personnel as either gifted or learning disabled according to test results and other data. Behaviors were attributed to personal, social, and emotional factors. When the IGLD Project assessment confirmed the school's evaluation of the child, the parents interpreted what was reported as negative and unacceptable.
5. Parents were on different levels of understanding regarding the nature of giftedness and learning disabilities.

Generally, the parents were very open and responsive to the IGLD Project. The quantity and quality of responses in interviews were such that the staff was unprepared to record the extremely detailed, individualized contributions and to properly categorize all the information obtained. As a result, the following recommendations are made for subsequent projects of this nature:

1. Meet frequently and for longer periods to discuss the individual child with the parents.
2. Provide a more extensive program of parent orientation to include more group parent discussion of the project and anticipated outcomes to develop better understanding of the project, terms used (i.e., LD, gifted), reporting procedures, and the activities.
3. State specifically both verbally and in writing how the outcomes of the assessment and instructional components are to be reported and used.
4. Be careful to clarify thoroughly the experimental, exploratory nature of the project to the parents.
5. Develop with the parents a theoretical framework for understanding the concept of learning-disabled gifted. Base the framework on previously researched theoretical assumptions with explanations and rationale. Discuss this with parents before and after the project.
6. Be very specific about the expectations held for parent involvement. Structure the parent interviews to allow the recording of all responses for later use.

IGLD Project

Assessment Component

The goal of the IGLD staff was to explore the nature of the intellectually gifted/learning disabled child and to suggest

further directions for research in the field. The purpose of the assessment phase was to determine if there were identifying characteristics common to the students referred as potentially both learning disabled and gifted. After reviewing current literature and research in the field of learning-disabled gifted and evaluating the assessment information obtained from various school systems, the IGLD staff structured their evaluation process to build on existing data bases, obtaining input relative to all developmental areas. Strategies or instruments for observable patterns of behavior regarding each child's use of language, social and emotional characteristics, and intellectual abilities were determined. Standardized tests that could be administered to all participating children or to specific age groups were selected.

Assessment procedures and tools were selected to complement school records by filling gaps. The developmental areas in which insufficient information was obtained from the schools became emphases of the IGLD Project assessment. The Project assessment process targeted three primary categories of needed information: (a) observational data, (b) assessment of social and emotional characteristics, and (c) additional standardized tests of cognitive characteristics and academic abilities.

IGLD Assessment Staff

The IGLD assessment staff was composed of ten females, seven of whom were graduate students at Kent State University.

Of these seven, three were certificated school psychologists and four were experienced teachers of gifted students. Three staff members were experienced learning disability teachers also. The school psychologists were the designated leaders of the assessment component and administered all standardized tests; other staff members administered the affective measures, observed language and social interaction, and interviewed the children's parents.

Evaluation of each child was based on the results of the standardized and informal tests, observations by staff members, and input from parents. With the school psychologists as assessment team leaders and with detailed observational reports from other team members, the IGLD staff was able to develop a more complete profile of characteristics for each child than test data alone could provide.

IGLD Subjects

As a result of the referral process involving schools and parents, twenty-three children ranging in age from six years eleven months to fifteen years ten months were involved in the assessment phase of the Project. The IGLD staff decided to allow all referred students to participate in the Project if their parents so chose. This decision was based on a desire to investigate the characteristics of those students whom schools were identifying as potentially learning-disabled gifted

regardless of the quality of evidence submitted relative to either exceptionality.

The children's grade levels for the upcoming school year ranged from first through ninth grade. Two of the children were female; twenty-one were male. The socioeconomic level of the children was perceived by the IGLD staff to be at the middle or upper middle class level. All parents had completed, or were in the process of completing, college degrees. Four of the children were from single parent families; the remaining nineteen children were from two parent families. Two children, a first grader and a sixth grader, were brothers.

The children attended seven different school systems, five of which were in close proximity to Kent State University. Two children attended an independent school with an upgraded curriculum while the remaining twenty-one children attended public school. Five of the twenty-one who attended public school were currently in learning disability resource room programs, primarily for reading and language instruction. One of these five students also had been identified by a neurologist as a child with an "attentional deficit" disorder. A total of eight students were currently receiving learning disability tutoring services: two for reading and language, two for math. The specific subject area of weakness was not indicated for the remaining four students receiving tutorial services.

Four students enrolled in the Project had been participating in the gifted program of their home school, one of whom had previously received learning disability services. Three students had been enrolled in regular educational programs with no supplementary special services. Information supplied by the parents of three of the children indicated that their children had been retained at some point in their school careers.

Assessment information received from the schools often did not indicate explicitly the basis for referral of the child as learning-disabled gifted. For ten of the twenty-three students involved in the IGLD Project the schools submitted no conclusive evaluation of the child as either gifted or learning disabled. Table 1 summarizes the school programs of IGLD participants. The content of the tables confirms the prevalent belief that most learning-disabled gifted students are in regular classrooms with relatively few receiving appropriate opportunities to participate in programming for the gifted. More often, the special services provided are for the learning disability.

See Table 1 on following page

Assessment Data Received from Schools

After receiving written parent permission to release confidential evaluation information, most home schools forwarded

Table 1

School Placement and Special Services of IGLD Participants

Student	Sex	CA	Grade Placement Fall '84	Regular Classroom	Learning Disability Tutoring	Learning Disability Resource Room	Gifted Resource Program
A	M	10-00	5	x	x		
B	M	08-03	3	x	x		
C	M	10-08	5	x	x		
D	M	08-08	3	x		x	
E	M	09-09	*4	x		x	
F	M	07-11	3	x			
G	F	08-07	3	x	x		
H	M	07-11	3	x	x		
I	F	09-08	5	x	x		
J	M	11-00	5	x		x	
K	M	06-11	*1	x (ungraded independent school)			
L	M	14-02	9	x			x
M	M	13-05	8	x			x
N	M	14-00	7	x	x		
O	F	17-06	6	x			x
P	M	15-00	9	x			
R	M	11-00	6	x (formerly received tutoring)			
S	M	11-11	*6	x (upgraded independent school)			
T	M	13-04	6	x		x	
U	M	12-06	7	x	x		
V	M	12-02	8	x		x	
W	M	11-03	6	x (formerly received tutoring)			
Totals				23	8	5	4

*Student had been retained one school year.

pertinent information to the IGLD Project Coordinator from either the student's cumulative record or from school psychological reports based on multi-factored evaluations. However, minimal assessment information was received for four children. The information received by the IGLD staff regarding these children consisted of the results of group achievement or group ability tests from the child's cumulative record file. The scores from one child's group ability test fell in the average to high average range; another child's score on the same test was in the average range. Achievement test scores were received for one of the other children; no assessment information was received for the remaining child.

Results of multi-factored evaluations were received for sixteen of the twenty-three students assessed in the Project. As was expected by the staff, most school reports included an assessment of intellectual ability on the Wechsler Intelligence Scale for Children-Revised (WISC-R). Two of the younger children had been administered other measures of individual intellectual ability; one seven-year-old scored in the superior range on the Stanford-Binet Test of Intelligence (IQ 140), while a six-year-old had a Full Scale score in the superior range (IQ 139) on the Wechsler Preschool and Primary Scale of Intelligence (WPPSI).

For fourteen of the sixteen children with multi-factored evaluations, WISC-R scores were reported which were analyzed by

the IGLD staff for comparison with findings reported elsewhere (Fox, et al., 1983). The mean Verbal Scale score for these children was 122 (range 91-143) and the mean Performance Scale score was 120.21 (range 91-132); the mean Full Scale score was 123.57 (range 90-133). A comparison of the WISC-R Verbal and Performance Scale scores of the fourteen children showed that three students had Verbal Scale scores that differed from their Performance Scale scores by at least one standard deviation, i.e., fifteen points. Two of the three had stronger verbal comprehension abilities while the third child's strength involved his ability to organize material perceptually. The Verbal and Performance Scale scores differed by less than fifteen points for the other eleven children.

See Tables 2 and 3 on following pages

A visual inspection of thirteen of the children's WISC-R subtest scores (see Table 3) revealed that their scaled scores for stronger areas ranged from fifteen to nineteen while the scaled scores in their weaker areas ranged from eight to twelve. Strengths on the Verbal Scale were: Information (N = 1), Similarities (N = 4), Vocabulary (N = 2), Comprehension (N = 4). These strengths reflect memory, reasoning, and verbal skills as well as an understanding of social situations.

Table 2

WISC-R Verbal and Performance Scale Scores

Student	Verbal Scale	Performance Scale	Discrepancy	
			V P	P V
B	122	131	-	9
D	115	129	-	14
E	91	91	-	-
F	136	106	30	-
G	131	117	14	-
J	125	115	10	-
L	120	117	3	-
M	113	132	-	19
O	143	114	29	-
R	122	131	-	9
S	139	117	22	-
T	112	130	-	18
V	108	130	-	22
W	131	123	8	-

Table 3

WISC-R Subtest Scaled Scores

Student	Information	Similarities	Arithmetic	Vocabulary	Comprehension	Digit Span	Picture Completion	Picture Arrangement	Block Design	Object Assembly	Coding	Mazes
B	12	16	8	15	17	9	13	11	19	14	15	-
D	11	15	10	13	14	7	14	16	13	12	15	-
E	8	11	10	9	5	12	9	11	11	8	4	-
F	18	16	15	17	12	12	8	15	14	11	7	-
G	15	12	12	19	17	12	16	13	10	12	11	-
J	12	19	8	18	14	8	11	12	17	16	5	-
L	SUBTEST SCORES NOT REPORTED TO IGLD PROJECT											
M	8	14	13	12	14	11	16	13	18	14	12	-
O	18	19	10	18	19	-	12	11	13	15	9	-
R	11	16	10	14	17	13	18	15	13	15	11	-
S	13	17	12	-	19	10	16	14	13	10	9	-
T	13	10	13	13	11	10	13	11	19	17	11	-
V	11	11	7	13	15	12	15	13	16	13	14	-
W	14	18	13	15	15	-	16	14	10	15	11	-
	N=13	N=13	N=13	N=12	N=13	N=11	N=13	N=13	N=13	N=13	N=13	
	$\bar{X}=12.62$	$\bar{X}=14.92$	$\bar{X}=10.85$	$\bar{X}=14.67$	$\bar{X}=14.54$	$\bar{X}=10.55$	$\bar{X}=13.62$	$\bar{X}=13.00$	$\bar{X}=14.31$	$\bar{X}=13.23$	$\bar{X}=10.31$	
	Range = 8-18	Range = 10-19	Range = 7-15	Range = 9-18	Range = 5-19	Range = 7-13	Range = 8-18	Range = 11-16	Range = 10-19	Range = 8-17	Range = 4-15	

Strengths on the Performance Scale included: Picture Completion (N = 4), Picture Arrangement and Object Assembly (N = 3 for each), and Block Design (N = 2). These subtests reflect a variety of skills--attention to details, sequential understanding of situations, ability to produce a meaningful whole from its parts, and spatial reasoning. Although the Coding subtest, which measures speed of associative learning and is indicative of visual-motor skills, was a strength for one child, it was found to be significantly weak for five others.

Weak Verbal comprehension abilities were found for eight children on the Arithmetic subtest, for seven children on the Digit Span subtest, and for one child each on the Information, Similarities, and Comprehension subtests. These weaknesses suggest deficits in attention, memory, reasoning, and understanding of social situations. On the Performance Scale, the Block Design subtest, reflecting spatial reasoning ability, and the Picture Completion subtest, reflecting attention to details, were weaknesses for one child.

In summary, there was no pattern of WISC-R performance evidenced in the same sample of students referred by schools to the Project because of "learning disabilities." The staff began to question the accuracy of the designated label and investigated the possibility the students would be more accurately described as "underachievers." Depressed IQ scores

also generated questions and suggested further evaluation of their giftedness.

In addition to measures of intellectual aptitude, school reports included results on standardized measures of academic achievement. Inspection of individual achievement test results contained in multi- factored evaluations indicated that the Woodcock-Johnson--Part II, the Peabody Individual Achievement Test, and the Wide Range Achievement Test had been administered in various combinations in the home schools to determine discrepancies among academic skills. The majority of the children were found to have weak reading and/or written language skills. Within each of these areas, the nature of the disability was not specified; i.e., the child's scores indicated generally weak basic reading skills or weak comprehension skills.

When asked on the Assessment Information Form (Appendix B) for "other pertinent information related to school performance such as special interests, exceptionalities, problems, observational reports, behaviors, attitudes" the responding schools provided additional information for only nine of the children. The schools gave no reason for the incompleteness of the other students' forms. Those responses that were given noted four children with socialization problems, three with difficulty completing assignments and meeting deadlines, and three with strengths in creativity. Other comments included

well-developed vocabulary (N = 2) and self-motivated (N = 2) and other comments pertaining to individual children.

From the data obtained from the schools, it was impossible to develop a definitive description or profile of characteristics for the children participating in the IGLD Project. No consistent pattern emerged from the analysis of the WISC-R data obtained for fourteen students to engender any descriptive generalizations or hypotheses to be tested while assessing characteristics of the IGLD child. The only pattern which emerged from the school information was that a majority of the children had test scores to confirm reportedly weak reading and/or written language skills.

Given the variety of assessment data provided and the apparent diversity of the children who had been "identified" as learning-disabled gifted by either the school or parents, the IGLD Project staff proceeded with the design of the Project Assessment to try to determine the characteristics of these children referred as learning-disabled gifted.

See Table 4 on following page

IGLD Assessment Procedure

The assessment component of the IGLD Project was completed prior to the instructional phase. The twenty-three participants were divided into four groups of children who were within a

Table 4

Individual Assessment Data Reported by Schools

Student	WISC-R	Binet	WPPSI	Otis-Lennon	P.P.V.T.	Iowa Achievement	California Achievement	Wide Range Achievement	Visual-Motor Integration (VMI)	Woodcock-Johnson Achievement	TOLD-P	Stanford Achievement	PIAT	Bender-Gestalt	TOWL	Key Math	Woodcock Language Proficiency	Diagnostic Test of Linguistic Abilities	TOLD-I	DTLA	ITPA	Gilmore Oral Reading
A	✓			✓	✓	✓	✓		✓	✓	✓											
B	✓																					
C	✓																					
D	✓							✓		✓												
E	✓				✓							✓										
F	✓				✓								✓									
G	✓				✓			✓		✓			✓				✓					
H	✓	✓			✓		✓	✓		✓			✓	✓				✓				
I					✓					✓				✓				✓				
J	✓				✓	✓				✓				✓								
K			✓										✓									
L	✓																					
M	✓																					
N	✓													✓								
O	✓						✓															
P	✓						✓															
Q	✓																					
R	✓				✓			✓		✓									✓			
S	✓							✓					✓							✓	✓	
T	✓																					
U	✓																					
V	✓																					
W	✓					✓				✓												✓

reasonable age range for the evaluation activities. Each group of five or six children came to the university to complete the assessment phase on a specified day. As each child arrived, he/she was assigned to a specific IGLD staff member who observed that child the entire day during all evaluation activities.

The schedule for each group followed the same format (see Table 5: Assessment Schedule). The first event of the assessment day was the gathering of children and parent(s) in the group meeting room for introductions of children, parents, and staff members. At that time information was provided to the entire group about the IGLD Project and the day's schedule. Following introductions and the overview of the day, there was time for the staff member who had been assigned to each child to become acquainted with that child and the child's parent(s).

See Table 5 on following page

The IGLD staff had anticipated a high level of anxiety in the children regarding assessment in a new setting. Thus, every effort was made to ensure that the children became comfortable with the setting, the staff, and the procedures. An informal, relaxed atmosphere with flexible scheduling of testing sessions to allow for individual children's needs was intentionally planned to allow the children to be more responsive to the testing situation.

Table 5

Assessment Schedule

8:15	Staff meeting.
8:30	Parents and children begin arriving.
9:00	Orientation - explain pairing of child and staff member, day's schedule, nature of Project. Informal interaction and introductions.
9:30	Group assessment begins for children; parent interview times scheduled.
10:00	Individual Cognitive Ability Test administered to child A, B, C; Affective Inventories administered to child D, E, F.
11:00	Children "flip-flop": Child A, B, C to Affective Inventories Child D, E, F to Cognitive Ability Test
12:00	Lunch break -- sack lunch and juice games and individual activities
1:00	Individual Cognitive Ability Test completed for child A, B, C; Group Language Assessment for child D, E, F.
2:00	Children "flip-flop": Child A, B, C to Language Assessment Child D, E, F to Cognitive Ability Test
3:00	Children dismissed; staff meeting.

Following the get-acquainted time, the children were taken to another room to begin the assessment process. They were administered two aptitude tests in a group setting: the Culture Fair Intelligence Scale - Scale 2 and the Raven's Progressive Matrices - Standard Form. As the children completed the latter test, they were free to return to the meeting room to have juice and to play a game and relax until all children had completed the group tests.

After a break, individual testing began. Three children were administered individual tests of cognitive ability by a Project school psychologist in a private room. During that time the other children in that day's group were given structured interviews individually by staff members, who recorded responses to the questions on standardized inventories for the social/emotional component of the assessment. After an hour, the children were alternated between the cognitive ability assessment and the social/emotional assessment. At the close of the second hour of assessment, there was an hour long lunch break.

During the lunch break, staff members and students interacted informally, some choosing to play the board games provided (Connect Four, Chess, etc.) while others enjoyed becoming acquainted through informal conversation. The lunch break also afforded the staff members opportunities to observe the children's social interactions and language in a less

structured setting. This information was considered in formulating the assessment report for each child.

After lunch, the children who had not finished the cognitive abilities phase of the assessment returned to their original examiner to complete it. The remaining children participated in the language assessment phase. After approximately an hour, the children once again exchanged places and completed the remaining assessment procedures. After all cognitive ability, social/emotional and language assessments were completed, the children were free to leave with their parents. The IGLD staff met to review the day and to evaluate the assessment data obtained for each child.

Assessment Instruments Selected

All children were assessed on three measures of cognitive ability, were evaluated on use of oral language, and were administered measures of self-concept and locus of control. Older children were also administered a measure of their attitudes toward school. Assessment instruments were selected based on a desire to avoid duplication of evaluation instruments with those previously administered to the children yet still provide appropriate and useful information.

Kaufman Assessment Battery for Children (K-ABC). The Kaufman Assessment Battery for Children (K-ABC) is a newly developed, individually administered measure of intelligence and achievement (Kaufman & Kaufman, 1983). Intelligence, as

measured by the K-ABC, is defined in terms of an individual's style of solving problems and processing information. The K-ABC includes ten processing subtests yielding three global processing scores (Simultaneous, Successive, and Composite) and achievement scores. The Sequential and Simultaneous Processing scales represent two types of mental functioning that have been identified independently by a number of researchers in neuropsychology and cognitive psychology. As defined by Kaufman and Kaufman (1983), "sequential processing places a premium on the serial or temporal order of stimuli when solving problems; in contrast, simultaneous processing demands a gestalt-like, frequently spatial, integration of stimuli to solve problems with maximum efficiency" (p. 2). The role of language and verbal skills was deliberately minimized in both processing scales of K-ABC.

The K-ABC was selected as an assessment instrument for the IGLD Project for use with the younger children (eleven years of age and younger) because it could contribute information about the child's ability to process information. The K-ABC also had not been administered to any of the children and the IGLD staff wanted to examine the value of this new instrument in investigating the specific information-processing characteristics of learning-disabled gifted children.

Reported studies (Kaufman & Kaufman, 1983) of learning disabled children have found that those children seem to have a

relative strength on the Simultaneous scale when compared to their performance on the Sequential scale. There is less precise information regarding gifted children, with the studies (Kaufman & Kaufman, 1983) indicating a 5½ point advantage on the Simultaneous scale for a group of identified gifted children, but a 5½ point advantage on the Sequential scale for a group of children who had been referred as gifted but not formally identified as gifted.

Since the K-ABC Simultaneous scale includes subtests which measure abilities often viewed as characteristics of giftedness (e.g., analogical reasoning, analysis/synthesis), and learning disabled children have been shown to have difficulty with Sequential Processing skills, the IGLD staff wanted to investigate whether or not the IGLD children would perform significantly better on the Simultaneous scale of the K-ABC.

Each K-ABC was administered by one of three certificated school psychologists trained in its administration. Assessment procedures followed the standards outlined in the test manual. Approximately one-half the assessments were performed in the morning, one-half in the afternoon.

Detroit Tests of Learning Aptitude (DTLA). The Detroit Tests of Learning Aptitude (DTLA), which is composed of nineteen subtests measuring reasoning and comprehension, practical judgment, verbal ability, time and space relationships, number ability, auditory and visual processing ability, and motor

ability, may be individually administered to a person between the age of three and adulthood (Baker & Leland, 1967). All subtests, however, are not suitable for administration throughout the recommended age span. When the entire battery of subtests is administered, a ratio IQ may be computed. In addition, the raw score on each subtest may be converted to a mental age score.

Generalizations from the research literature on gifted and learning disabled children were considered in selecting subtests of the DTLA. The literature concerning gifted children identifies high verbal ability as a characteristic of this population while information regarding learning disabled children suggests a possible language deficit (Clark, 1979; Fox, et al., 1983; Johnson, 1981; Kirk, 1962; McCarthy & McCarthy, 1969; Whitmore, 1980). Other attributes of gifted children include superior processing ability and memory. Learning disabled children reportedly have difficulty in remembering auditorially presented information and in following oral directions as well as accurately perceiving social situations. Theoretically, these aforementioned abilities differentiate between the gifted and the learning disabled child and affect his/her academic performance.

Appropriate portions of the DTLA were chosen for administration to the older students (ages 11-0 and older) enrolled in the IGLD Project because, like the K-ABC, the DTLA

could provide a measure of processing abilities. The processing abilities measured by the DTLA reflect strengths and/or weaknesses in processing information through the auditory and visual modalities whereas the K-ABC measures the individual's ability to process information sequentially and/or simultaneously which is received primarily through the visual modality. In addition, the subtests were selected to reflect behavioral characteristics which the literature suggests as a means of differentiating between gifted and learning disabled children.

Seven subtests were chosen to provide information regarding the child's verbal ability, memory, attention to auditory information, social judgment, and ability to follow multi-step directions. These subtests required the child to process information primarily through the auditory modality. Therefore, the data from the older group of children which reflected auditory processing of information could not be compared to the K-ABC results of the younger group of IGLD children which reflected visual information processing. Nevertheless, because of the exploratory nature of the project, the subtests of Verbal Absurdities, Social Adjustment A, Verbal Opposites, Likenesses and Differences, Attention Span for Unrelated and for Related Syllables, and Oral Directions were selected.

Verbal Absurdities and Social Adjustment A were chosen as measures of humor and social perception, while the subtests of

Verbal Opposites and Likenesses and Differences were included as measures of verbal ability and/or verbal fluency.

The remaining subtests required the student to attend to information presented auditorially. Two of these subtests, Attention Span for Unrelated Words and for Related Syllables, reflect the ability to remember and verbalize progressively longer sequences of words which differ in terms of degree of meaningful associations between the words. The Unrelated Words had the least amount of shared meaning between the words while the Related Syllables which were sentences had the highest amount, i.e., the semantic and syntactical associations were lower in the Unrelated Words task than in the Related Syllables task. On the Oral Directions subtest, a pencil-paper task, the student demonstrated attention span and ability to remember by executing a series of directions.

During the first assessment session of older participants, all seven DTLA subtests were administered. The administration time for all seven subtests extended into the time allotted for the language and social/emotional evaluation, therefore, the subtests of Verbal Absurdities and Social Adjustment A were omitted for the remaining older participants because of the time constraints. It was decided that the characteristics of humor and social judgment which these two subtests measure could be studied in the group interactions of the language evaluation phase. The five subtests administered to the remaining older

students were Verbal Opposites, Likenesses and Differences, Attention Span for Unrelated Words, Attention Span for Related Syllables, and Oral Directions. These subtests provided measures of verbal concept formation, verbal fluency, and short-term memory, tasks on which gifted children frequently excel and which are frequently difficult for children with learning disabilities.

Raven's Progressive Matrices - Standard Scale (SPM). The Raven's Progressive Matrices Test (SPM) is a group-administered measure of the ability to reason by analogy as well a measure of general mental capacity (Raven, et al., 1977). It was administered to all IGLD participants in group settings of five or six children. The five subtests of twelve problems each are designed to measure progressively more complex abilities to understand the relationships between the figures presented in each problem. This ability is demonstrated by the examinee's selection of a figure to complete a problem. A gross estimate of each child's time to complete each subtest was recorded by the head proctor based on the elapsed time from the start of the subtest until the subject raised his hand to indicate completion of the subtest. Because each child proceeded through the five subtests at his or her own rate, two other examiners answered questions or gave directions for the succeeding subtests.

Cattell Culture Fair Intelligence Scale - Scale 2 (CFIT). The Culture Fair Intelligence Test (CFIT), which also was

administered to all the IGLD participants in group settings of five or six children was chosen to provide another measure of general intellectual ability. According to the manual (1973), the test is purportedly free from the influences of "verbal fluency, cultural climate, and educational influence." In general, the subtests require the examinee to perceive relationships in shapes and figures. The four timed subtests included in Scale 2 required the child to select the figure (a) which completed a progressive series of figures; (b) which could not be classified along the same dimensions as the other four figures; (c) which completed the design; and, (d) in which a dot could be placed so that its relationship to each part of the design duplicated the conditions of the model.

Both the Culture Fair Intelligence Test and the Standard Progressive Matrices were included in the assessment as measures of general intellectual ability, to see where the IGLD students' scores would fall. A review of the literature suggests that gifted children demonstrate superior memory and reasoning skills while learning disabled children may have inefficient learning strategies and visual and/or auditory perceptual disturbances (Clark, 1979; Fox, et al., 1983; Whitmore, 1980; Johnson, 1981; Kirk, 1962; and McCarthy & McCarthy, 1971). Both the CFIT and the SPM require the examinee to use visual reasoning skills. Therefore, the purpose of including these two instruments was to

explore the IGLD child's reasoning skills using a visual problem-solving task.

Language Evaluation

An assessment of language ability was included in the IGLD assessment because the literature suggests that gifted individuals are highly proficient in the use of language while learning disabled individuals are deficient in this area (Clark, 1979; Whitmore, 1980; Wiig & Semel, 1976). In addition, difficulties in social interactions have been attributed to learning disabled children. It was hypothesized that differences in the functional use of language might account for social difficulties.

Two areas of language which were included in the IGLD assessment involved the child's ability to produce and comprehend language and his/her functional use of language, pragmatics. Both areas involve the processing of verbal information. Production and comprehension of language refers to the expressive and receptive phases of information processing and is reflected in the vocabulary chosen as well as the syntactical and the semantic structure of verbalizations. Pragmatics also requires the reception of information and expression of a suitable verbal response but in a social context. The child uses his verbalizations for purposes such as acquiring information, satisfying his needs, interacting with others, controlling others (Halliday, 1977).

The language behaviors of IGLD participants were observed and noted during the individual and group testing situations, in informal circumstances, and while participating in group problem-solving tasks. Formal evaluation of each child's language was done in groups of three to five children who were given a problem to solve. Two different tasks were given to each group that required a verbal exchange to accomplish the goal. During the first task the group was directed to complete a tangram puzzle. Each member of the group was given an envelope of variously shaped pieces of paper for the group to use in forming five squares of a specified size. The second task required the group to formulate a story based on a commercially prepared, poster-sized picture. The group created three stories, each based on a different picture.

During both the tangram and the story tasks, Project staff members recorded the conversation of the children as the children participated in the task. Each observer recorded the verbal responses of the child assigned to her. An experimental checklist of language behaviors, developed by Dr. Gladys Knott (Appendix C), guided the observers as they recorded and later analyzed the children's use of language during the structured tasks.

Each child's language skills were rated as to how well they reflected comprehension, production, and use of language. The child's vocabulary, use of syntax and semantics, as well as the

functional and/or social uses of language, were included as categories of the checklist. Each child's use of language in informal conversations, as observed during the lunch break and between assessment sessions, was included in the final analysis of language skills.

Sears Self-Concept Scale

The Sears Self-Concept Scale reveals the individual's perceptions of self as compared to others of the same age. The categories of self-perception within which the individual compares self to same-sex children include physical ability, appearance, convergent and divergent mental processes, social relations with same sex peers, social virtues, work habits, happy qualities and school subjects. This instrument was administered to all children using a structured interview technique.

Intellectual Achievement Responsibility (IAR)

A locus of control measure, the Crandall Intellectual Achievement Responsibility Scale (IAR) also was administered to every child. Each of the thirty-four items required the child to choose one of two responses which reflected either a sense of external locus of control (LOC) where responsibility is attributed to someone or something in the environment or a sense of internal LOC where responsibility is ascribed to oneself. These responses were elicited for situations representing success and/or failure in an academic setting.

Thinking About My School (TAMS)

The older children were administered an inventory assessing their attitudes toward school, Thinking About My School (TAMS). TAMS is an inventory which asks the child to indicate the frequency of occurrence for positive and negative attributes or conditions of the school environment, including perceived relationships between teachers and students as well as among peers. The forty-seven item questionnaire requires students to respond to descriptive statements related to school experiences with answers which indicate the frequency of occurrence, ranging from "not at all" to "all of the time."

The self-concept and attitude toward school measures were included because of information which suggests that learning disabled students have poor self-concepts. The difficulties which the learning disabled child encounters in a school setting may be reflected in his attitude toward school. Therefore, the measures of self-concept and attitude toward school might distinguish between gifted and learning disabled children.

Information Derived from Parents

During the assessment of the children, a parent interview was conducted by a staff member who also guided the completion of a questionnaire. Items on the interview questionnaire (Appendix B) asked the parent to list the child's academic strengths and weaknesses as well as his/her hobbies and interests. The parent(s) described their perception of their

child's self-concept and his/her relationship with family members.

See Table 6 on following page

IGLD Project

Assessment Results

Kaufman Assessment Battery for Children (K-ABC)

The K-ABC, because of its unique orientation to information processing, shows promise as a possible tool to help delineate characteristics and needs of the learning-disabled gifted child. However, at the time of this study, the manual reported no data concerning this population.

The K-ABC was used in the IGLD Project to determine whether a discrepancy between Simultaneous and Sequential Processing abilities exists for a sample of children identified as learning-disabled gifted. The IGLD staff wanted to find out how children referred to the Project as learning-disabled gifted would score on the Simultaneous Processing scale and the Sequential Processing scale of the K-ABC. The results obtained might support the literature regarding learning disabled and gifted children or produce a different result for learning-disabled gifted. The results also might reveal normal abilities and call into question the label attached to the children.

Table 6

Administration of IGLD Assessment Instrument

Student	K-ABC	DTLA	SPM	CFIT	Sears	IAR	TAMS	Parent Questionnaire	Oral Language Evaluation	WISC-R
A	x	-	x	x	x	x	-	x	x	-
B	x	-	x	x	x	x	-	x	x	-
C	x	-	x	x	x	x	-	x	x	-
D	x	-	x	x	x	x	-	x	x	-
E	x	-	x	x	x	x	-	x	x	-
F	x	-	x	x	x	x	-	x	x	-
G	x	-	x	x	x	x	-	x	x	-
H	x	-	x	x	x	x	-	x	x	-
I	x	-	x	x	x	x	-	x	x	-
J	x	-	x	x	x	x	-	x	x	-
K	x	-	x	x	x	x	-	x	x	-
L	-	x	x	x	x	x	x	x	x	-
M	-	x	x	x	x	x	x	x	x	-
N	-	x	x	x	x	x	x	x	x	-
O	-	x	x	x	x	x	x	x	x	-
P	-	x	x	x	x	x	x	x	x	-
R	-	x	x	x	x	x	x	x	x	-
S	-	x	x	x	x	x	x	x	x	-
T	-	x	x	x	x	x	x	x	x	-
U	-	-	x	x	x	x	-	x	x	x
V	-	x	x	x	x	x	x	x	x	-
W	-	x	x	x	x	x	x	x	x	-

A dependent t-test of means was performed to allow for comparison of scores. The results indicated no significant difference between the child's performance on the two scales (Simultaneous Scale: $\bar{X} = 116.9$; Sequential Scale $\bar{X} = 104.8$; $\bar{x}_d = 12.1$, $t[9] = 1.998$, $p < .05$).

Inspection of the individual subject profiles indicated that only three of the ten subjects had Sequential scores of greater magnitude than Simultaneous scores. As can be seen in Table 7, the two subjects with the greatest Sequential Simultaneous discrepancy were the only females in the sample. As sex may have been a compounding factor, a subsequent t-test was performed, excluding scores for the two females. Results from this analysis showed the Simultaneous scores were significantly higher than the Sequential scores ($\bar{X} = 15.6$, $t[7] = 3.043$, $p < .01$).

Informal analysis of the difference between the individual subtest scores on the Simultaneous and Sequential scales computed according to procedures reported in the K-ABC manual indicated that six children had significant Sequential $<$ Simultaneous discrepancy scores; two female subjects had significant Sequential $>$ Simultaneous discrepancy scores and two male subjects had no significant discrepancy.

IGLD Project findings did not produce evidence that students identified as Intellectually Gifted/Learning Disabled performed significantly better on the Simultaneous versus

See Table 7 on following page

Table 7

Sex, Age, and Mental Processing Scale Scores for IGLD Project Participants

Student	Sex	Age	Mental Processing Scale		
			Sequential	Simultaneous	Sequential-Simultaneous
A	Male	10-0	104	120	-16
B	Male	8-3	104	121	-17
C	Male	10-8	100	126	-26
D	Male	8-8	87	117	-30
F	Male	7-11	122	117	+5
G	Female	8-7	126	106	+20
H	Male	7-11	104	134	-30
I	Female	9-8	119	104	+15
J	Male	11-0	80	112	-32
K	Male	6-11	102	112	-10

Sequential Processing Scales of the K-ABC. While mean differences were in the predicted direction, they did not reach statistical significance for the entire group. However, inspection of the data indicated an apparent sex difference, with the two female subjects obtaining score patterns different from those of the males. Whereas all but one male showed superiority on the Simultaneous scale, both females showed a significant strength on the Sequential scale. Additional analyses of the male sample data indicated that, for the group of male IGLD children who participated in the IGLD Project, sequential processing abilities are less developed than simultaneous processing abilities; this fact may be contributing to their learning difficulties in school.

As females were not equally represented in this study and in the sample, caution must be used in interpreting the data to suggest the possibility of a significant sex difference. The IGLD staff recommends that future research explore the possibility of different patterns or profiles of scores on the K-ABC for males and females due to the abilities tapped by certain subtests. Specifically, the Simultaneous scale includes several tests which involve spatial ability (Matrix Analogies, Triangles and Spatial Memory). The first two of these are subtests on which learning disabled populations have performed best (Kaufman & Kaufman, 1983). Investigations over the years have suggested that males have significantly better developed

abilities in this area. The females' relatively lower scores on these tasks (one had a significant weakness in Triangles) may have contributed to the difference found between the groups. An alternative explanation for any sex differences suggested by the results may be that operational definitions of giftedness and learning disabilities used by schools and teachers are different for males and females. Whereas giftedness in females may be associated more with high verbal facility and language related skills, it may be more highly associated with analytical reasoning and manipulative skills for males. Males referred as learning disabled may have a higher proportion of distractibility, attention and concentration problems than females referred as learning disabled. These differential definitions would lead to a significantly different sample population, which would be reflected in a test assessing information-processing styles, such as the K-ABC.

Despite the limitations of this study, the findings suggest a need for further research investigating the information-processing styles of learning-disabled gifted children, and research which looks more closely at possible sex differences. Information gained from such investigations would be useful for educators attempting to plan intervention and education strategies best suited for this newly defined population.

See Tables 8, 9, 10, 11, and 12 on following pages

Table 8

K-ABC Global Scale Scores

Student	Sequential Processing		Simultaneous Processing		Mental Processing Composite		Achievement	
	Standard Score	National %ile Rank	Standard Score	National %ile Rank	Standard Score	National %ile Rank	Standard Score	National %ile Rank
A	104	61	120	91	115	84	117	87
B	104	61	121	92	117	87	107	68
C	100	50	126	96	117	87	128	97
D	87	19	117	87	105	63	97	42
F	122	93	117	87	122	93	123	94
G	126	96	106	66	116	84	108	70
H	104	61	134	99	125	95	115	84
I	119	90	104	61	111	77	117	87
J	80	9	112	79	99	47	107	68
K	102	55	112	79	109	73	103	58
	N=10		N=10		N=10		N=10	
	$\bar{X}=104.8$		$\bar{X}=116.9$		$\bar{X}=113.6$		$\bar{X}=112.2$	
	Range=80-126		Range=104-134		Range=99-125		Range=97-128	

Table 9

K-ABC Mental Processing Subtests: Scaled Scores ($\bar{X}=10$; SD=3)

Student	Sequential			Simultaneous				
	Hand Movements	Number Recall	Word Order	Gestalt Closure	Triangles	Matrix Analogies	Spatial Memory	Photo Series
A	10	13	9	9	14	15	14	12
B	14	8	10	9	15	14	15	12
C	9	11	10	11	16	13	12	16
D	6	8	10	11	13	14	11	13
F	12	14	14	10	16	14	11	11
G	18	14	10	11	9	12	11	12
H	9	12	11	15	17	13	12	16
I	15-16	12	11	8	11	11	10	13
J	8	6	6	10	13	15	9	12
K	6	10	15	14	13	12	11	9
	N=10	N=10	N=10	N=10	N=10	N=10	N=10	N=10
	$\bar{X}=10.7-10.8$	$\bar{X}=10.8$	$\bar{X}=10.6$	$\bar{X}=10.8$	$\bar{X}=13.7$	$\bar{X}=13.3$	$\bar{X}=11.6$	$\bar{X}=12.6$
	Range=6-18	Range=6-14	Range=6-15	Range=8-15	Range=9-17	Range=11-15	Range=9-15	Range=9-16

Table 10

K-ABC Achievement Subtests: Standard Scores ($\bar{X}=100$; $SD=15$)

Student	Faces & Places		Arithmetic		Riddles		Reading/Decoding		Reading/ Understanding	
	Standard Score	National %ile	Standard Score	National %ile	Standard Score	National %ile	Standard Score	National %ile	Standard Score	National %ile
A	101	53	123	94	124	95	110	75	116	86
B	103	58	114	82	108	70	104	61	104	61
C	121	92	123	94	117	87	125	95	129	97
D	96	39	107	68	110	75	89	23	89	23
F	120	91	118	88	110	75	127	96	120	91
G	106	66	94	34	118	88	107	68	120	91
H	105	63	108	70	117	87	108	70	125	95
I	123	94	97	42	124	95	113	81	115	84
J	110	75	115	84	127	96	88	21	90	25
K	111	77	105	63	121	92	85	4	--	--

Table 11

Sex, Age, and DTLA Subtest Scores and Ranks for IGLD Participants

Subject	Sex	Age	DTLA Subtests									
			Verbal Opposites		Attention Span				Oral Directions		Likenesses & Differences	
			MA	R	Unrelated Words	Related Syllables	MA	R	MA	R	MA	R
L	M	14-2	16-9	1	9-0	5	11-6	4	15-0	2	13-0	3
M	M	13-5	14-0	3	13-3	4	11-6	5	14-9	2	17-0	1
N	M	12-3	14-0	2	8-3	5	12-0	3	11-3	4	17-6	1
O	F	10-9	17-6	2	13-8	3	13-0	4	12-9	5	19-0	1
P	M	15-10	15-0	2	11-0	5	14-6	4	14-9	3	17-9	1
R	M	11-0	13-6	2	12-6	5	13-3	3	13-0	4	16-9	1
S	M	11-11	17-6	1	8-0	5	10-3	4	11-9	3	16-9	2
T	M	13-4	15-9	2	8-9	5	9-3	4	14-9	3	17-3	1
V	M	12-2	14-9	2	12-0	4	12-0	5	14-0	3	16-0	1
W	M	11-3	13-6	2	10-9	4	11-0	3	10-9	5	16-0	1

Table 12

IQ, Percentiles, and Ability Levels of the CFIT and the SPM

Subject	Culture Fair Intelligence Test			Standard Progressive Matrices	
	IQ	%ile	Ability Level	%ile	Ability Level
A	130	97	Very Superior	93	Superior
B	112	77	High Average	>95	Very Superior
C	105	62	Average	71	High Average
D	115	83	High Average	>95	Very Superior
E	108	69	Average	50	Average
F	119	88	High Average	Not Administered	
G	105	62	Average	89	High Average
H	98	45	Average	83	High Average
I	100	50	Average	48	Average
J	116	84	High Average	71	High Average
K	<87	21	Below Average	55	Average
L	109	71	Average	90	Superior
M	136	99	Very Superior	90	Superior
N	115	83	High Average	75	High Average
O	116	84	High Average	92	Superior
P	102	55	Average	93	Superior
R	105	62	Average	83	High Average
S	119	88	High Average	80	High Average
T	136	99	Very Superior	>95	Very Superior
U	122	92	Superior	90	Superior
V	118	87	High Average	95	Very Superior
W	97	43	Average	78	High Average

Detroit Tests of Learning Aptitude (DTLA)

Five subtests of the DTLA were administered to all the older group of students: Verbal Opposites, Auditory Attention Span for Unrelated Words, Auditory Attention Span for Related Syllables, Oral Directions, and Likenesses and Differences. For each of the five subtests, the child's raw score was converted to a mental age (MA) score. Each child's MA score on the five subtests was rank ordered from one through five--one being the subtest with the highest MA score and five being the subtest with the lowest score. In addition, the MA score on each subtest was compared with the child's chronological age.

Inspection of the DTLA data indicates that only two of the children's MA scores exceeded their chronological age on all five subtests (see Table 11). Neither of these children were receiving any learning disability services; one child was in a regular classroom situation while the other attended classes for the gifted. In addition, these two subjects were the two youngest members of the older group of IGLD students. The other eight children had at least two and as many as four mental age scores which were lower than their chronological age. On the two subtests of attention, Auditory Attention for Unrelated Words and for Related Syllables, eight subjects' scores were less than their chronological age. Three of those eight attended programs for the gifted, one was in a regular class with no supplementary services, and the remaining four were

receiving learning disability services. On the subtest Oral Directions, three of the ten children earned an MA score which was less than his chronological age.

When the child's rank on each of the five subtests was compared for each child, eight of the eleven participants earned their lowest rank and conversely their highest MA score on either the subtests of Verbal Opposites or on Likenesses and Differences, both of which measure verbal ability. The ranks assigned to these subtests were either one or two while the MA's ranged from 13-6 to 17-6 and from 13-0 to 19-0, respectively. It appeared to the staff, therefore, that these children who ranked first and/or second on Verbal Opposites and/or Likenesses and Differences have well-developed verbal/fluency skills in relation to their attentional skills. It should be noted, however, that one child had a MA score on the Likenesses and Differences subtest which was less than his chronological age.

Two subjects (L and M) had subtest ranks which deviated from those of their age mates with regard to the rank order of their strong skills. Subject L's subtest ranks were Verbal Opposites - Rank = 1, Oral Directions - Rank = 2, and Likenesses and Differences - Rank = 3. Subject M's subtest ranks in ascending order were found to be Likenesses and Differences, Oral Directions, and Verbal Opposites, Ranks 1, 2, and 3 respectively. For both Subject L and M who attended

gifted programs at their home school, it would seem that in addition to having well-developed verbal skills, these two were also able to listen and complete a multi-step task with a high degree of accuracy.

On the Oral Directions subtest, the mental age scores for the group ranged from 10-9 to 15-0. The MA score on this subtest received a rank of 3 for four Ss (P, S, T, and V). Two of the four, P and S, however, earned MA scores that were less than their chronological ages. The remaining four subjects' (N, O, R, and W) performance on this subtest resulted in the lowest and/or second lowest mental ages and conversely the ranks of 4 and 5. Two of the four, O and R, had MA scores which exceeded their chronological age while the remaining two had MA scores that were less than their chronological age. The low MA scores would seem to indicate a weakness in remembering and executing sequences of directions on pencil-paper tasks. In an educational setting, this would correspond with difficulties in completing written assignments when multi-step directions were given orally.

For the majority of children (N = 6), the two subtests requiring attention as well as short-term verbal memory skills, i.e., Attention Span for Related Syllables and for Unrelated Words, received the ranks of 4 and 5. Six children attained the lowest MA score when asked to remember and verbalize a progressively longer series of unrelated words. These six

children had a rank of 5 on this subtest, while the other four children achieved a rank of 4, indicating this task was the second most difficult for them. The MA scores for this subtest ranged from 8-0 to 13-8. Eight of the ten children had a lower MA score than their chronological age. These results suggest the possibility that students who experience difficulty with this task may also experience difficulty in understanding and remembering new material and/or technical vocabulary when it is presented in an educational setting.

The subtest Attention Span for Related Syllables was difficult for seven Ss, five of whom received the rank of 4 and two earned a rank of 5. Three members of the older group earned a rank of 3 on this subtest. The MA scores for this task ranged from 9-3 to 14-6 with eight of the ten children earning a lower MA score than his chronological age. This subtest required the S to remember material for which some degree of meaning and for which some associations existed, i.e., syntactical rules.

In general, the results of the DTLA subtests seem to indicate that two students had highly developed verbal skills which allowed them to respond fluently. For the majority of participants, however, there was a lag between the MA score and the child's chronological age on tasks of verbal skills. In spite of this difference between MA score and chronological age, the verbal skills were found to be stronger than the attentional skills. The most difficult of the attention tasks required the

child to use short-term auditory memory skills for Unrelated Words while the task with the least degree of difficulty asked the child to remember and execute a series of commands on paper. These findings suggest that the older IGLD child who participated in this Project possesses some of the characteristics of the gifted child, particularly more highly developed verbal abilities, which the literature attributes to gifted children, as well as characteristics of the learning disabled child, i.e., difficulties in attending to auditory stimuli. During the instructional phase, however, many of the children had difficulty naming something to eat that is green or listing flavors of ice cream other than chocolate or vanilla. This task of verbal fluency required the child to retrieve from his memory responses which pertained to a specific category and to generate a series of responses, whereas the DTLA tasks required only one response, thus creating an easier task and perhaps leading to a false conclusion about the students' verbal abilities. The hypothesis that learning-disabled gifted students possess high verbal abilities should be researched more thoroughly using additional measures of verbal ability.

Because the subtests of the DTLA which were used in the IGLD assessment involved only the auditory modality for processing information, there is no information available from the IGLD Project assessment regarding the child's use of the visual modality for processing information. Therefore, the

Project obtained no information to determine which is the child's preferred or stronger modality for information processing. Other weaknesses of the use of the DTLA concern the out-dated norming sample which may make the mental age score inappropriate for current populations. This criticism may no longer be valid since a revised DTLA is now available.

Raven's Standard Progressive Matrices (SPM)

Culture Fair Intelligence Test (CFIT)

In order to compare the scores from the CFIT and the SPM along comparable dimensions, several conversions were performed using the raw scores of total number of correct problems. The total number of correct problems on the SPM was converted to a percentile and the raw score on the CFIT was converted to a standard score equivalent according to the tables in their respective administrative manuals (Ravens et al., 1976, Table SPM X; and Kirk, 1973, Table 5.2, p. 23). The CFIT standard score underwent a second conversion to a percentile rank using a percentile rank table for a test with a mean of 100 and a standard deviation of 16 (Sattler, 1982).

Percentile ranks on the CFIT ranged from 21 to 99. The youngest child in the group scored at the twenty-first percentile. Because this six-year-old was chronologically two

years below the suggested age for individuals being administered Scale 2, his score may reflect an age bias; i.e., he had not developed the reasoning skills required to solve these problems. Scale 1 would have been more appropriate to administer to this child on an individual basis but then his scores could not be used in the group comparison. This child's score may also reflect difficulties in processing visual information which is necessary to solve a problem thereby contributing to a learning disability.

When the six-year-old's score was disregarded, it was found that the CFIT percentiles ranged from 43 to 99. Three students scored in the Very Superior range; i.e., a percentile rank of 95 or greater; one student, in the Superior range, the 90th to 94th percentile; eight, in the High Average range, 75th to 89th percentile; and nine in the Average range of the 43rd to 74th percentile.

On the SPM, percentiles ranged from 50 to 99. Four children scored at the Very Superior level, six at the Superior level, eight at the High Average level, and three at the Average level. Twenty of the participants scored at an equivalent or higher level on the SPM than on the CFIT, possibly because of the built-in training procedure of SPM Sets A and B. In addition, the untimed procedure of the SPM may have been beneficial since it permitted all children to complete the

entire sixty problems at their own rate of information processing.

Future analysis of CFIT and SPM scores from a larger number of subjects as well as from comparison groups of gifted and of learning disabled children are necessary to determine if there are analogic reasoning skills characteristic of intellectually gifted/learning disabled children using a visual problem-solving task. Information from this Project, however, indicates that these IGLD children varied in their ability to solve problems requiring the use of visual-perceptual and reasoning skills. Whether the level of this ability results from factors which contribute to the learning disability or from maturational differences is a question which future research studies may explore.

See Table 13 on following page

Language Assessment

Language behavior was observed and noted throughout the assessment day: during the individual and group testing situations, in informal social circumstances, and while the individual was participating in structured group problem-solving tasks. Specific attention was given to language production and use during a group activity in which the children solved a tangram puzzle, developed group stories based on three

Table 13

Ability Level Range of Scores: CFIT and SPM

Ability Level	Culture Fair Intelligence Test N=22		Standard Progressive Matrices N=21	
	N	%age of IGLD Project Population	N	%age of IGLD Project Population
Very Superior	3	14%	4	19%
Superior	1	5%	6	29%
High Average	8	36%	8	38%
Average	9	41%	3	14%
Below Average	1	5%	0	0%

Percentages may not equal 100 due to rounding

different pictures and during a group discussion relating to school and what changes the students would make in their schools.

All of the sixteen students who participated in the language assessment phase were judged by the observers to have language production and comprehension at or above age level expectations. Thirteen of the students exhibited the ability to use language appropriately for both functional and social uses when necessary and to modify language to individual and situational needs. The remaining three students had difficulty with the social use of language, especially as it pertains to using language to control and direct peers and to manipulate adults and situations.

The exploratory nature of the language assessment resulted in a non-standardized evaluation of the IGLD students' oral language. Although comprehensive training for the assessment staff in assessing children's language capabilities was originally planned, a series of events caused the training sessions to be modified. As a result of limited training, some of the staff members experienced difficulty in using the experimental language checklist due to limited experience in assessing language. More extensive training would have provided the necessary experience as well as have increased inter- and intra-rater reliability.

Future efforts in language assessment of learning-disabled/gifted children might consider using data from the cognitive abilities assessment instruments to augment the more formally obtained language assessment data. Data from the DTLA subtest might be used to enrich the language evaluation and to provide some measure of verbal fluency. Attempts to measure the verbal fluency of learning-disabled gifted children could provide information about characteristics which may be attributed to this subpopulation of gifted children.

Sears Self-Concept Inventory

The Sears Self-Concept Scale provides the individual's self-report of perceptions of self as compared to others of the same sex and age on a scale of 1 (not so good), 2 (OK), 3 (better than most), 4 (very good), 5 (excellent). The overall rating for each category is based on the average of the subject's rating of all the questions in that category. The sum of the weighted responses and the average response was calculated for each category as well as a total score.

In comparing underachieving gifted children and well-achieving gifted children, Whitmore (1980) found mean scores for the Sears Self-Concept Inventory to be 3.16 (underachieving gifted class, Fall, 1968), and 3.26 (well-achieving gifted class, Fall, 1968). The majority of the IGLD Project subjects ($N = 23$) scored lower in overall self-concept ($\bar{X} = 2.96$; range = 1.97 - 3.90) than did the underachieving gifted children in

Whitmore's study. When the IGLD subjects' scores are combined into grade level groupings (Table 15), a pattern emerges. The categories of Convergent Mental Processes, Social Relations, Work Habits, Happy Qualities, School Subjects and Total mean scores were 3.12 or higher for first and second grade children, but decreased with each successive older group of children. This data suggests possible negative effects of the subjects' school experiences resulting in lowered self-concepts.

As the IGLD staff analyzed the data from the Sears Self-Concept Inventory, it became apparent that the instructional component could be structured so as to provide an opportunity to encourage the development of a more positive self-image in the students. This became one of the major goals of the instructional component.

See Tables 14 and 15 on following pages

Intellectual Achievement Responsibility Inventory (IAR)

The IAR reveals individual perceptions of locus of control. The instrument "is designed to determine to what extent children attribute success and failure in school to external or internal causes" (Whitmore, 1980, p. 362). Subjects are required to choose one of two responses (internal or external) to explain a school-related situation. Responses are scored to indicate internal responsibility for success (I+), internal

Table 14

Individual Mean Scores by CategoriesSears Self-Concept Scale

Student	Physical Ability	Attractive Appearance	Convergent Mental Processes	Social Relations same sex	Social Virtues	Divergent Mental Processes	Work Habits	Happy Qualities	School Subjects	TOTAL
D	3	3.8	3.4	3.5	3.8	3.3	4.3	4	3.4	3.5
G	4	3.5	3.5	4.3	3.5	4.3	2	4.3	3.9	3.8
H	5	4	3.5	4.8	4	3.6	3.8	3.8	3.4	3.9
K	2	1.8	2.1	2.8	2	1.9	2	2	1.8	1.97
B	4	4	4	4.3	4.5	3.6	3.5	4.3	3.8	3.9
I	2.5	2.3	2.8	4	2.5	3	2.5	3	2.3	2.8
A	2.8	2	2.1	2.5	2.8	3	3.5	3.8	2.8	2.8
C	3.8	2.3	2.6	4	3	3.4	2.5	4	3.3	3.2
J	4.8	2.5	3.9	3.8	3	3.3	3	3	2.3	3.3
E	1.25	3.2	3.4	1.3	3.5	2.6	4	3	3.1	2.9
F	0	2	3.6	0	1.5	3.8	1.3	1.5	3.4	2.5
O	0	3.5	3.6	1.3	2.8	4	2	2.3	3.5	2.9
T	4	2.5	2.9	2.3	2.5	2.4	1.5	2	2.5	2.6
W	3.3	2	2	2.5	2.3	2.1	1.8	3	2	2.3
N	4	4	3.1	3.8	4.3	2.6	2.2	2.5	2.8	3.1
R	3.3	3	2.8	3	3.25	2.9	2.3	2.3	3.9	3
S	4.5	4	3.1	4.5	3.5	4.1	2	4.3	3.1	3.6
V	2	2	2.5	1.8	2.8	3.5	2	2.3	2.4	2.5
M	3.5	2.5	3.6	2.8	1.8	3.4	2	2.5	2.8	2.9
P	1.3	1.5	2.4	2.2	3.2	3.4	1.3	3.8	2	2.4
L	2.8	2.5	2.9	2	2	3.8	1.3	1.8	2.4	2.5
Q	3.8	2	2.3	2.5	2	3.8	2.3	2.5	3.6	2.9
U	1.5	2.25	2.87	2.5	3.5	3.6	2.3	3.3	2.1	2.7
$\bar{X}=2.92$ (N=23)		2.75	3.00	2.89	2.96	3.28	2.41	3.01	2.90	2.96

Excellent = 5

Very Good = 4

Better Than Most = 3

OK = 2

Not So Good = 1

Table 15

Mean Scores by Categories -- Grade Level GroupingsSears Self-Concept Scale

Grade Level Grouping	Physical Ability	Attractive Appearance	Convergent Mental Processes	Social Relations same sex	Social Virtues	Divergent Mental Processes	Work Habits	Happy Qualities	School Subjects	TOTAL
1st & 2nd Grade	3.6	3.42	3.3	3.94	3.56	3.22	3.12	3.68	3.26	3.14
3rd & 4th Grade	2.52	2.38	3.06	3.02	2.72	3.18	2.8	3.05	2.86	2.97
5th & 6th Grade	3.18	3.16	2.92	2.9	3.11	3.02	1.97	2.73	2.97	2.97
7th & 8th Grade	2.48	2.13	2.76	2.3	2.55	3.58	1.87	2.7	2.55	2.65

Excellent = 5

Very Good = 4

Better Than Most = 3

OK = 2

Not So Good = 1

responsibility for failure (I-), external responsibility for success (E+), or external responsibility for failure (E-). Scores can then be obtained to denote frequency of I or E responses.

Scores obtained from the IGLD subjects indicated comparatively higher internal responsibility for both success and failure and lower external responsibility for success and failure. These apparent high feelings of personal responsibility may negatively affect self-esteem depending upon the degree of success the child perceives himself to have. If the child perceives himself to have little or no success and much failure, the perception of internal responsibility for failure may significantly lower that child's self-esteem. Further investigation is recommended regarding the effects of perceived locus of control in relation to the school performance, behavior, and self-concept of the learning-disabled gifted child.

See Tables 16 and 17 on following pages

Thinking About My School (TAMS)

According to Whitmore (1974) the TAMS score is "expected to reflect a general attitude toward school experience," with a higher score reflecting a more positive and desirable attitude/perception toward school life. Items of the TAMS may be

Table 16

Individual ScoresIntellectual Achievement Responsibility Inventory

Student	*I+	*I-	*E+	*E-	*NR
B	15	14	2	3	
D	13	10	4	7	
G	16	12	1	5	
H	16	3	1	14	
K	10	7	7	10	
I	13	6	4	10	1
A	16	9	1	8	
C	12	12	5	5	
J	12	14	5	3	
E	12	9	5	8	
F	12	10	5	7	
O	11	12	2	4	5
T	13	13	4	4	
W	10	11	7	6	
N	11	10	5	7	1
R	13	15	4	2	
S	17	1	0	16	
V	11	10	5	7	1
M	16	12	1	5	
P	12	12	4	5	1
L	8	9	7	4	6
Q	15	13	2	4	
U	10	9	6	7	2
Total	294	233	87	151	
$\bar{X}$	12.78	10.1	3.78	6.56	
Range	8-17	1-15	0-7	2-16	
Mode	12	12	4	7	
Median	12	10	5	6	

*I+ = Internal Responsibility for Success

*I- = Internal Responsibility for Failure

*E+ = External Responsibility for Success

*E- = External Responsibility for Failure

*NR = No Response

Table 17

Mean Scores -- Grade Level Groupings

Intellectual Achievement Responsibility Inventory

Grade Level Grouping	*I+	*I-	*E+	*E-
1st and 2nd Grade	14	9.2	3	7.8
3rd and 4th Grade	10.67	10	3.17	6.83
5th and 6th Grade	12.5	10.33	3.67	6.5
7th and 8th Grade	12	10.83	4.17	5.33

*I+ = Internal Responsibility for Success

*I- = Internal Responsibility for Failure

*E+ = External Responsibility for Success

*E- = External Responsibility for Failure

clustered into five theoretical scales--Power, Social (peer relationships), Work, Teachers, and Liking for School--to examine attitudes toward specific areas of school life.

Analysis of the IGLD subjects' TAMS score reveals that the subjects' attitudes and feelings toward school are not overly positive. Mean scores on all items ranged from 2.17 - 2.91; subtest mean scores ranged from 2.30 - 2.59, all below an expected mean of 3.00.

Liking for School, which is indicative of enthusiasm for school as compared to other students, was the lowest rated for four of the ten IGLD subjects and rated highest for only one subject. Power, indicative of perceived ability to influence persons and events in the school environment, was rated highest for three subjects; lowest for two. Social, the amount of favorable perceptions of peers, was rated highest by four subjects, lowest by two subjects. The subscale of Teachers, which reflects the degree of positivism toward teachers, was rated highest by two subjects and lowest by one subject. Work, reflecting the degree of positivism toward schoolwork, was rated highest by one subject, lowest by one subject.

A comparison of school placement (Table 1) and subscale scores on the TAMS (Table 19) reveals no pattern or significant relationship between the two for any of the subscale areas. The main finding of the IGLD Project's use of the TAMS is that these subjects' mean scores were generally lower (IGLD $\bar{X}$ = 2.57) than

would be expected ($\bar{X} = 3$) and that the subjects' overall attitude toward school life is less than positive.

See Tables 18 and 19 on following pages

Parent Questionnaire/Interview

The parent interview and questionnaire (Appendix D) provided valuable information regarding the child from the parents' perspective. Parents generally seem to recognize their child's strengths and weaknesses and seemed to have realistic expectations for their children.

An analysis of the parents' responses to the questionnaire reveals several commonalities for many of the IGLD children. Many of the parents ($N = 22$) noted organizational problems ($N = 12$), problems with task completion ($N = 10$), and sensitivity ($N = 8$) as characteristic of their children. Other items mentioned included a dislike for reading ($N = 3$), distractibility ($N = 2$), and honesty ($N = 2$). The problems noted by the parents, notably organizational problems, difficulty with task completion, and distractibility could account for many of the children's difficulties achieving in school. A high degree of sensitivity and honesty, often considered to be characteristics of gifted children (Whitmore, 1980; Clark, 1979), may account for the children's generally poor attitude toward school and low self-concepts.

Table 18

Thinking About My School (TAMS): Mean Scores

Student	Mean Score (All Items)
L	2.17
M	2.47
N	2.64
O	2.36
P	2.28
R	2.77
S	2.43
T	2.77
V	2.91
W	2.85

N = 10

$\bar{X} = 2.57$

Table 19

Thinking About My School (TAMS): Mean Subscale Scores

Student	$\bar{X}$ Power	$\bar{X}$ Social	$\bar{X}$ Work	$\bar{X}$ Teachers	$\bar{X}$ Liking for School
L	2.25	2.38	2.13	2.00	1.60
M	2.63	2.13	2.63	2.00	2.80
N	2.38	2.38	2.63	3.00	2.20
O	2.00	2.75	2.63	2.25	1.40
P	2.50	2.50	2.13	2.38	2.20
R	2.75	2.63	2.63	2.25	2.40
S	1.75	3.13	2.38	2.13	2.20
T	2.63	2.63	2.63	2.88	2.60
V	3.25	2.50	2.88	3.13	2.80
W	2.00	2.75	3.25	3.00	2.80
	N=10	N=10	N=10	N=10	N=10
	$\bar{X}=2.41$	$\bar{X}=2.58$	$\bar{X}=2.59$	$\bar{X}=2.50$	$\bar{X}=2.30$
	Range= 1.75-3.25	Range= 2.13-3.13	Range= 2.13-3.25	Range= 2.00-3.13	Range= 1.40-2.80

IGLD Project

Instructional Component

After the assessment phase, the IGLD staff set about structuring the instructional component of the IGLD Project. Several staff meetings were held to discuss the assessment results and to determine the design of the instructional component. The purpose of the instructional component was to provide an appropriate and motivating educational program for the IGLD students as well as to provide the IGLD staff with an opportunity to work with and observe IGLD students to further evaluate and assess their characteristics and behaviors. It was decided that the program would be divided into three instructional areas: computer education, affective development, and a study of the brain, learning and behavior.

Because of the IGLD students' expressed interests in computers and based on the experiences of Tobin and Schiffman (Fox, et al., 1983), computer education was included in the instructional component as a vehicle to develop skills in following directions, accepting and learning from mistakes, higher level thinking skills, logical thought patterns as well as skill in computer use.

Affective development sessions were included to provide opportunity for students to explore social relationships, self-concept, and to explore ways of dealing constructively with

stress through relaxation exercises, activities utilizing visual imagery, dance and movement, and listening to literature or recorded music.

The study of the brain, learning, and behavior was included in the instructional component to provide the students with knowledge about learning disabilities and giftedness which would lead to greater self-understanding for the students.

The thirteen students who participated in the instructional component were divided into grade level groups: primary (three students), upper elementary (six students), and junior high (four students). Each day the general format followed a pre-planned schedule, yet was always as flexible as necessary to meet individual and group needs that day. The day began with time for social interaction and sharing (ten to twenty minutes). This was followed by three forty-five minute blocks of time to accommodate the three instructional components: computer education, study of the brain and learning, and affective development. Each day's session ended with a group meeting of ten to twenty minutes during which students and staff together evaluated the day and prepared for the next day.

Brief descriptions of the three instructional components follow. The authors for each section are IGLD staff members who were directly involved with the development and implementation of each component.

Computer Education

Dr. Nancy Wingenbach

The primary purpose for the inclusion of computer education in the instructional component was the provision of a highly motivating, non-threatening, individualized instructional process using a popular tool (computer) with the skills easily transferable to home and school. This instruction also addressed the perceived student need for control and recognition of the control (metacognition) over a process which had been stated as one of the goals of the entire IGLD program. Instruction was based on the use of six Apple IIe computers, A Guide to Programming in Applesoft by Bruce Presley (1982), Turtle Logo (MIT Version), and Microzine packets. The following goals and objectives provided the direction for the computer education component:

Goal: Provide a sense of accomplishment and mastery

Objectives:

- . Provide for skill development in operation and programming of the computer
- . Maintain high motivational component via product-oriented instruction (Basic and Logo programs)
- . Develop a sense of metacognitive relationship through students' control over both process and production

Goal: Engage students in use of higher level thinking skills--analysis, synthesis, evaluation

Objectives:

- . Teach students to predict, analyze, and evaluate their own and others' programs in Basic and Logo
- . Emphasize and develop awareness of the sequential reasoning process
- . Involve the students with problem solving processes as they learn to program
- . Encourage the use of a simultaneous reasoning process
- . Expose the students to organizational skills in relation to time use, sequence of procedures, pre-planning, and setting priorities

Goal: Encourage creativity and risk-taking

Objectives:

- . Provide a non-critical, positive environment of exploration of programs and processes in using computers
- . Explore cause-effect and sequence of programming
- . Teach students the control each has over the computer
- . Provide opportunities for exploration of various program results on an "if - then" basis

Encourage the students to experiment with the knowledge gained to produce their own programs, designs, graphics

Structure, Procedures, Content

The instructors for the computer education component were the IGLD Project Coordinator and a peer tutor, a young man 14 years old who was highly skilled in computer programming. Each IGLD student had computer time of forty-five minutes per day throughout the three week instructional program. Originally the students were grouped according to self-reported previous experience and knowledge of computers. However, the age range within the groups made instruction difficult. The younger students required more individual attention and a slower pace for instruction whereas the older students, despite previous computer instruction, did not have a common set of experiences. As a result, within the first two days of class, the students were regrouped by grade level:

Group A included four male students at the middle school level. Instruction focused on learning programming in Basic. Within a brief time the students were reacting favorably, learning the Basic programming process, and enjoying the instruction of the peer tutor. The IGLD Project Coordinator served as an assistant in this particular class.

Group B included six students at the upper elementary level (five males and one female). Instruction was divided between programming in Basic and programming in Logo. Again, the peer tutor worked with three of the students on Basic programming. The other three students elected to work with Logo programming taught by the IGLD Project Coordinator.

Group C included three male students in the primary grades. Instruction for these students used Logo programming, supplemented by educational packages called Microzines. These younger students seemed to enjoy the use of the Logo turtle to draw various designs. Both the peer tutor and the IGLD Project Coordinator worked with the students individually.

As the instruction was occurring, other IGLD staff members observed the instructional groups and noted specific students' responses and reactions to the computer instruction. The instructional process was individualized, constantly analyzed, and modified as individual needs surfaced. The flexibility of the curriculum provided for easy movement from one group to another as well as from one topic focus to another.

Analysis, Summary, Evaluation

Group A, the middle school group, seemed to draw together naturally as a result of their age similarity. There was some

vying for attention and the leadership role, but one student ("N") emerged rapidly as the leader.

Group B, the upper elementary group, divided early in their interests with three students selecting to learn programming in Basic and three selecting programming in Logo.

Group C, comprised of two third graders and one first grader, worked independently for the most part although at times the two third graders would work jointly on a program. This group of students did not operate as a group in the same manner as did the other two groups. The independence and individuality of the group were perhaps the result of the differences in personalities, the younger age level, and the small size of the group.

All the IGLD students were interested and excited about the computer instruction. Some had previous computer experience through classes at school or home instruction. Despite this previous experience, each of the students' basic computer skills needed much refinement and additional instruction in either Basic or Logo. The students, especially the older ones, came to the first class anticipating playing computer games. Though somewhat disappointed with the curriculum to be followed, each was willing to work with either Basic or Logo. By the end of the sessions, games were secondary and the students were willing to work and experiment within the curricular framework. The students maintained an interest in experimentation with

programming, were excited by the degree of control they exerted on the computer and progressed from simply following instructions (Basic or Logo) to experimentation and "trying out new ideas." Two field trips, one to a computer software company where the students were shown how various types of software are produced and another to the Psychology Department at Kent State University where they learned about robots and how they are programmed, further motivated the students as they progressed in learning computer programming.

The involvement of computers within the curricular framework of this program for IGLD students provided the opportunity for goal attainment. The students demonstrated a sense of accomplishment and mastery as they progressed through Logo and Basic programming instruction. The students spoke with expressed pleasure and pride of their mastering of computer programming and shared their excitement with each other. The students frequently asked to be allowed to stay after class to continue their work on their programs. Students who had access to a computer at home would continue their work there in the afternoons and evenings. The computer component appeared to provide these IGLD students with confidence in their ability to learn.

As they learned computer programming, the IGLD participants also engaged in higher level thinking skills. As students progressed through basic programming techniques, each was

required to analyze programs and to anticipate outcomes. Each also had to synthesize various program techniques in order to develop a final program. The evaluation process was constant as the Basic or Logo program developed and the product appeared. A significant aspect was the verbalization of the reasoning process as each student explained how and why procedures were selected and combined to form the program.

As the students became more and more comfortable with the computer, each began to experiment, to risk "trying out" a procedure or set of procedures. This risk-taking became apparent as the programs became more complex and detailed. The creative aspect was most evident in the Logo programming as various programming techniques were combined to result in unique and intriguing designs.

For the IGLD students, the computer presented a non-threatening, individualized program. At the outset, the purpose was to teach the students that they could control a situation and were responsible for the product. Computers also allowed for instruction in analysis of process (in this case, programming) and the opportunity for discovery learning via experimentation with programming. As students recognized their control over the process and the product, they began to analyze the process as errors occurred or changes needed to be made, and finally exercised that control as programs were changed.

The concept of metacognition (awareness of the cognitive process) was introduced and experienced as a part of the computer curriculum in terms of programming and acceptance of responsibility for product. This same concept was reinforced in the other IGLD Project curriculum areas: as acquisition and application of knowledge were discussed in the Brain Room and the monitoring, control and analysis of tension, muscles, and verbal/non-verbal behaviors were discussed and experienced in the Relaxation Room. The computer instructional component provided a vehicle, a process, and a product for addressing the goals of the IGLD Project.

Based on the IGLD Project experience with the use of computers and computer instruction within the context of the IGLD instructional format, it is recommended that computer instruction be included when developing a program for intellectually gifted/learning disabled students. The computer provides a highly motivating vehicle for application of learned skills, sequencing of information, analysis of procedure, control over process and transfer of knowledge. The ease with which instruction in computer programming can be individualized also provides a non-threatening atmosphere for students to progress at their own rate and to experiment with knowledge gained without constant monitoring. Computer instruction is also conducive to group effort and peer tutoring as each student can contribute to group programming efforts while still working

within the framework of his or her own program. Computer instruction teaches responsibility for success and failure in a non-threatening environment as each student develops his/her own program and is ultimately responsible for the program outcome.

The use of the computer programming also provides the instructor with the opportunity to analyze individual students' sequential and simultaneous thought processes as each student develops his/her program. In programming, especially with Logo, students must think sequentially while anticipating the end result at the same time. As an example, some of the IGLD students experienced difficulty building a program step-by-step because they could not break the program down into sequential steps. These same students had difficulty reviewing the program for finding errors initially, although they knew what the end result should be. Other students could build a program but could not predict what would happen when the program was complete.

The use of the computer within the instructional framework of the IGLD program was extremely positive both in what the students accomplished and in the information the staff obtained through instruction and observation of the individual students. An important consideration, however, would be the addition of a pre-instructional assessment to determine each student's computer knowledge and level of skill. This information could then provide an individual entry point into the instructional

sequence. A second consideration would be to establish an evaluation procedure to be applied to the individual student's progress both in terms of process and product. The addition of these two evaluation procedures would enhance the computer education component.

Study of the Brain, Learning, and Behavior

Julie Shuman

A second component for the IGLD instructional session was a study of the brain, learning, and behavior, known to the students as "The Brain Room." The primary purpose of this instructional component was to provide students with a nonconventional content area of high interest and personal meaning, in a format similar to what is generally used in gifted education resource rooms. It was expected that students would develop greater self-understanding through their study of the brain, learning, and learning disabilities. The following goals and objectives provided the direction for this component of the instructional component:

Goal: Provide an instructional atmosphere in which
 students are free to interact socially with one
 another and with the instructors while learning

Objectives:

- . Students will actively listen to each other
- . Students will interact with each other as they
 work independently or as a group

- . Students will reflect on discussions by sharing ideas and feelings

Goal: Provide an understanding of the parts and functions of the brain

Objectives:

- . Students will study recent research and newly formulated theories pertaining to brain functions
- . Students will learn the functions of the brain and man's use of the brain
- . Students will understand the relationship of the brain with all parts of the body
- . Students will design and make a model of the brain or of a body system dependent on the brain
- . Students will explore and share information pertaining to parts and functions of the brain
- . Students will evaluate their own model of the brain or body system

Goal: Provide an understanding of a creative problem solving process

Objectives:

- . Students will learn the five steps of the Parnes Creative Problem Solving Method
- . Students will use those five steps in teacher-made problem situations

- . Students will apply the problem solving process to problems in which they are interested

Goal: Provide an opportunity for students to work as a group to solve problems

Objectives:

- . Students will plan a strategy for solving a given manipulative problem
- . Students will share responsibility for solving a given problem
- . Students will actively manipulate given materials to solve the problem
- . Students will evaluate strategy taken to solve the problem and evaluate the degree of success

Goal: Provide an opportunity for students and instructors to share information on parapsychology and unusual powers of the brain

Objectives:

- . Students will learn and share information pertaining to parapsychology and other powers of the brain

Goal: Provide an opportunity for students to develop greater self-understanding, both mentally and physically

Objectives:

- . Students will develop awareness of mental and physical self
- . Students will express thoughts and feelings pertaining to awareness of self and others
- . Students will develop greater control of mental and physical self

Structure, Procedures, Content

The grouping of the IGLD students for the forty-five minutes per day of brain study was the same as for the computer instruction. Generally, the students in all age groups were exposed to the same content and learning process, modified appropriately for each age level.

Throughout the first days of this instructional component, the IGLD instructors were indirectly assessing the students' knowledge about the brain. Instruction during this time was teacher-directed with mainly teacher input and questioning and limited student participation. The IGLD students resisted this didactic teaching, making these first two or three days of instruction quite difficult. The instructors hypothesized that a modification of teaching strategies would be necessary and the inclusion of a more active role on the students' part more appropriate. The difficulty of the first few days seemed to arise from the need to have clearer, more specific objectives communicated to the students and from the students' expressed

need for a more active role in the planning and learning process. The students also seemed to need the security of a schedule and clarity regarding what was expected of them each day.

The following few days' activities supported the instructors' hypothesis. A film, "The Human Body - The Brain" was shown to the students and the instructors attempted to lead a group discussion about the film. The film was technically advanced yet many students from the two older groups of students (groups A and B) complained that they already knew about the brain and that discussing the film was boring. However, based on the students' responses to questioning, the instructors determined that the students were not able to demonstrate that they knew the information.

On the following day, the instructors confronted group A (the oldest students) concerning their remarks the previous day that this instructional component was "boring." They were asked what they would suggest doing and the students suggested making models of the brain (this activity was already in the original plans of the instructors). The instructors encouraged the students to expand on their ideas. The students suggested materials that could be used for making the models and discussed the advantages and disadvantages of various modeling materials such as clay and salt/flour mixture. The final decision, made jointly by the students and instructors, was to allow the

students to construct individual models of the brain using the modeling medium of their choice.

After these few initial days, the students became more actively involved in the activities of the "Brain Room." They apparently had needed a sense of ownership in what was happening and their participation in planning and directing their learning experiences seemed to make the learning more meaningful to them.

Analysis, Summary, Evaluation

As the students made models of the brain, it was discovered that the students in all three age groups thoroughly enjoyed working with the dough and clay. The process of kneading and shaping the clay seemed to provide a release of tension. This activity also provided more time for social interaction. Students in all three groups talked about many interests as well as shared information about what they were doing. For example, Student F and Student K (of the youngest age group) engaged in a political debate (this was during the 1984 presidential primaries). Student F became so engrossed he could not focus in on his project, although Student H easily debated while he also completed his task. Student K (age 6) worked between the other two boys, commenting on the conversation (occasionally Gary Hart's name was mentioned and Student K humorously made a pun about the candidate's "heart"), and completing a complicated model of the eyes which included the details of the optic nerve.

After an introduction to the nature of the problem solving and the steps included in the Parnes Creative Problem Solving Model, the IGLD students practiced applying the model to teacher-made and group-identified problems. Skills learned were then used to solve a problem involving manipulative materials. The problem, to be solved by the group independently of the instructor, was selected from those included in the Olympics of the Mind Problem Book.

The manipulative problem involved two primary tasks: (a) to build a bridge on which to suspend a coffee can and then (b) to see how many golf balls the can would hold. This problem was intended to encourage cooperative group work among the students in addition to the application of learned problem solving skills. Group B (upper elementary age) rushed through the problem with little interaction on procedures to solve the problem. Group A (middle school age) interacted quite well, discussing various aspects related to solving the problem. This group was successful in finding a correct solution. In Group C (the primary age students), Student F became quite upset with Students H and K because they were not solving the problem the way he wanted them to. Student F wanted to leave the room. Students H and K continued to work together to solve the problem while Student F did not participate and rambled on about the unfairness of not doing it his way.

The problem solving aspect of the instruction in the Brain Room was well accepted by the students because of the active participation involved. Activities were designed for group interaction which provided additional insights into social development. The activities also strengthened the realization by students and instructors that members of the groups were forming friendships and trust with one another.

During the second and third weeks of the instructional component, students learned about brainstorming and were given the opportunity to brainstorm as a warm-up exercise for part of each instructional day. It appeared that in all three groups, verbal fluency was low in this type of task. When asked to produce lists of flavors of ice cream, names of candy, or uses for bars of soap, responses were minimal. However, by the third week, the students had improved in this type of task and were able to produce more fluent and flexible responses.

The brainstorming exercise was used not only as a warm-up activity, but also as an opportunity to assure the students that all responses would be accepted. Therefore, an environment conducive to creative thought and to positive social interaction was developed.

Following the presentation of information concerning parts of the brain and experiences in problem solving, students learned about and discussed parapsychology, ESP, and other unique powers of the brain. These topics were included because

one of the IGLD Project's goals was to help the students develop greater self-understanding, both mentally and physically, and the staff had been stressing mental and physical control of self during the sessions. All three age groups were highly interested in these topics. A guest speaker talked about inner mental powers and what ultimate power each person has within his mind to control himself and what he does. The speaker related this power of control to athletes and how it helps in reaching goals set within the mind. This speaker presented an example of self-control using the mind that was appealing to the students. The idea of using self-control to achieve specific goals seemed to be new to many of the students.

The "Brain Room" was perhaps the least successful of the three instructional components. It was also the component that was most like previous school experiences for the students. Though attempts were made to modify the content, teaching/learning process, and expected products, the students resisted the school-like structure, format, and content. The IGLD staff felt it important to persevere--to strive to develop a more positive attitude in the students toward what they obviously believed to be a distasteful experience, i.e., school. Based on observations of student reactions to various strategies used during this component of the IGLD Project, the following recommendations are made:

1. Students should be involved in planning for the learning process as much as possible. Student directed learning appears to be more effective with these students.
2. Offer students a variety and choice of learning activities to accommodate their individual learning styles and strengths.
3. Explain to the students, in explicit terms, the goals for each lesson and specific expectations for student participation.
4. Move to a challenging instructional level quickly and spend most of the instructional time at that level.
5. Develop coherence among all components of the instructional program. The components should fit together to facilitate transfer of learning.
6. Build in time for staff meetings, preparation, and daily evaluation.

Affective Development

As the IGLD staff planned activities for Affective Development, it was decided to emphasize the development of positive social relationships, self-concept, and ways of dealing with stress. This section of the instructional component became known as the "Relaxation Room."

Relaxation Room

Kathy Frazier

"The 'self-image' is the key to human personality and human behavior. Change the self-image and you change the personality and the behavior.

But more than this. The "self-image" sets the boundaries of individual accomplishment. It defines what you can and cannot do. Expand the self-image and you expand the 'area of the possible.' The development of an adequate, realistic self-image will seem to imbue the individual with new capabilities, new talents, and literally turn failure into success."

Psycho-Cybernetics (xix - Preface)

Maxwell Maltz

The ideas expressed in this excerpt from the preface of Psycho-Cybernetics were the foundation for the lessons planned for the "Relaxation Room." It was hoped that learning to deal with stressful situations and excess energy would improve the students' ability to concentrate and learn, to develop and improve social relationships, and to develop a more positive self-concept. The following goals and objectives directed the activities for this component of the instructional program:

Goal: Students will improve their self-concept and self-control

Objectives:

- . Students will develop the ability to set goals and become positive thinkers
- . Students will use relaxation techniques to improve concentration, social relationships, and study skills

Goal: Students will express their feelings and ideas in a positive way

Goal: Students will expand their creativity by using visual imagery and guided meditation

Structure, Procedures, Content

Specific activities for the Relaxation Room were quite varied: guided meditation; exercises using visual imagery; breathing exercises; listening to the reading of The Little Prince by de St. Exupery and discussing feelings it evoked; specific relaxation exercises; concentration techniques; even a lesson in break dancing taught by two of the IGLD students! Instructional emphasis was on the development of self-control--body, mind, and behavior.

Analysis, Summary, Evaluation

Student responses to the activities of the Relaxation Room were generally positive. After some initial self-consciousness, students actively participated and seemed to enjoy the activities. Students exhibited noticeably improved behavior and

attitudes toward each other and became more open during the group evaluation sessions at the end of each morning.

Social growth was evident among the students: students progressed from thinking only about themselves to genuine concern and understanding for each other as well as for the instructors. The positive changes in attitude and behavior that occurred over the three week instructional period were far greater than the staff had anticipated. The ideas and concepts that were the underlying focus of the Relaxation Room--the development of positive self-image, self-control, understanding and respect of self and others--also pervaded the other components of the IGLD instructional program so that affective development became an integral part of the overall instructional program. It was in this social/emotional realm that the most growth was observed in the IGLD students.

IGLD Project

Outcomes/Findings/Hypotheses

Assessment of Learning-Disabled Gifted Children

One purpose of the IGLD Project was to try out methods, instruments, or procedures and to evaluate their effectiveness. If the Project were to be replicated, however, issues concerning the assessment instruments and procedures must be considered. In identifying these issues it is hoped that the data collection process will be improved.

One concern involves the use of the K-ABC and the DTLA which were chosen as individually administered measures of ability. Ideally, in a cross-sectional study, comparable measures of ability should be administered to all subjects participating in the project. This was not possible for two reasons. One, the K-ABC, in which the IGLD staff was interested, has not been developed as a measure of sequential and/or simultaneous processing ability beyond age twelve. At the present time, there is no companion instrument which can provide information about the type of processing ability used by individuals from age twelve to adulthood. Two, when the actual referrals of children by the schools were received by the IGLD staff, the age range was larger than anticipated. Because of the exploratory nature of the Project, the decision was made to include the entire age range. Therefore, if all students who had been referred to the Project were to be accepted, it would not be possible to ascertain whether the subjects whose chronological age was greater than eleven years could process sequentially or simultaneously presented information with equal ease or whether one mode of processing was more highly developed than another. Thus, the decision was made to use a different cognitive measure, the DTLA, for those older children.

Another assumption which affected the choice of instruments was that learning disabled students experience difficulty with tasks which require them to process information received through

the auditory modality. The subtests of the DTLA which were administered relied heavily on input from the auditory mode and required verbal comprehension, verbal fluency, and memory skills. Comparing responses to tasks presented through both sensory modalities would have helped the IGLD staff to recognize which sensory channel was more effective in a learning situation and would have possibly provided greater insight into the nature of the IGLD subjects.

A similar criticism might be leveled at the K-ABC which presents most material through the visual channel, thus precluding a comparison of sensory modalities. For learning disabled students, it is important to identify their strongest learning modality and to help them develop their weaker modality to provide maximum input to the brain. Neither the DTLA subtests which were administered nor the K-ABC allowed a comparison of learning modalities.

In addition to the issues raised regarding the assessment instruments, two issues can be raised concerning the assessment procedures. The first issue centers on the division of children into older and younger groups. After a careful inspection of the ages included in both the older and younger groups of the IGLD Project, it became apparent that the upper age limit of the younger group and the lower age limit of the older group overlapped: an eleven-year-old child was administered the K-ABC and a different eleven-year-old child completed the tasks of the

DTLA. Because of the overlap, any statistical analyses concerned with age effects may be confounded. If a wide range of children is involved in subsequent projects, care must be taken in dividing the children into younger and older groups to insure that the ages of the groups are mutually exclusive.

The second issue centers on the data collection process as it involved the subjects' schools. Early in the Project, the IGLD staff began to question the accuracy of the learning-disabled gifted label which schools had applied to the IGLD participants. The schools had identified the IGLD students on the basis of a deficit model (high potential - low performance). However, test scores did not indicate patterns that have been associated with learning disabled or learning-disabled gifted children, i.e., WISC-R Verbal-Performance discrepancies meaningfully larger than normal or with extreme amounts of subtest scatter (Schiff, et al., 1981). There seemed to be confusion regarding the application of the learning-disabled gifted label, with overlapping occurring between the diagnosis of learning disabled and underachievement. The IGLD staff believes that the majority of the students referred to the Project should actually be considered underachieving gifted children rather than learning-disabled gifted children. It appears that the difficulties associated with definition and identification in both the fields of learning disabilities and

gifted may become compounded for schools when the two exceptionalities are thought of as occurring together.

These observations reflect a need for a more thorough approach to data collection for children referred by schools to projects similar to the IGLD Project. The population of children referred to the Project was small ($N = 23$) and so diverse that it was difficult to form generalizations from the results of either the assessment phase or the instructional phase. The observations also suggest a need for researchers to provide explicit information to the school regarding the nature and expected characteristics of children to be involved in exploratory or pilot projects. To enable schools to capitalize on knowledge gained from exploratory projects, useable and manageable information regarding outcomes and results of such projects should be provided.

Another issue relates to the assumption that the older children were weak in processing sequential information. This assumption was based on the experiences of staff members and on the research literature. To strengthen the sequential mode of processing information all students received instruction using the computer. Without assessment data to support this assumption, it may not be valid.

Nature of Learning-Disabled Gifted Children and Implications for Instruction

Although the number of actual learning-disabled gifted

children participating in the IGLD Project was small, the following hypotheses regarding the nature of the learning-disabled gifted child were developed as a result of the IGLD staff's observations and assessment of the IGLD children and based on the staff's research into the field.

It appears from studies of successful individuals identified as learning-disabled gifted that these individuals have overcome their deficits by compensating with strengths. One characteristic often used to distinguish intellectually gifted children from average children is a superior potential for the development and use of higher order thought processes such as analysis, synthesis, evaluation, and the manipulation of abstract symbols and ideas. The gifted student uses knowledge of the world and cognitive information processing skills to implement these higher order thought processes. It may be that for learning-disabled gifted individuals, a weakness in a particular performance mode causes the individual to function via "altered processing" of information to compensate for that weakness.

Altered processing for the learning-disabled gifted individual may include a metacognitive approach to information processing strategies. Because of high intellectual ability, the learning-disabled gifted individual is able to recognize processing weaknesses and selectively compensate/substitute for them: the individual uses metacognition to selectively

assemble, control, and execute cognitive processes. The metacognitive approach to this altered processing involves a series of strategies which may occur intuitively rather than overtly consciously: the individual's analysis of his/her own strengths and weaknesses; gaining control over the cognitive processing of information; selection of appropriate processing to compensate successfully for the perceived weakness (i.e., using auditory input to supplement visual input); and combining of this selective processing of information with the individual's knowledge of the world to achieve the desired outcome. Time seems to be a critical element in the successful altering of information processing strategies; time is needed to recognize weakness and to actively compensate/substitute for it.

Learning-disabled gifted students are often frustrated by the difference between their ability to understand complex, diverse concepts while still being disabled in the sense of accomplishing or mastering the regular modes of information processing normally utilized by people. The frustration forces the learning-disabled gifted student to begin to exercise control over, substitute and implement specific cognitive strategies to the degree that successful cognitive processing of information/concepts occurs. The learning-disabled gifted student then becomes capable of consciously manipulating the information processing modes to compensate for learning

disabilities and to thus successfully accomplish the reception and expression of information/concepts, ideas, skills, etc.

Based on these hypotheses and the experiences of the IGLD instructional component, the following implications and recommendations are made for the education of learning-disabled gifted children:

1. Evaluate individual strengths and weaknesses in information processing (performance components).
2. Determine which strategies are implemented and successful.
3. Assist the students in developing metacognitive strategies.
4. Assist the students in recognizing the information processing strategies used to accomplish goals.
5. Teach learning-disabled gifted students how to compensate for weaknesses using strengths, i.e., "reading" using prior knowledge and key words to signal concepts.
6. Use the educational process as a means to develop higher order problem-solving and information processing skills.
7. Develop new methods to teach/model the use of these strategies for other learning-disabled gifted children.
8. Allow time for the learning-disabled gifted students

to accomplish the substitution of one performance mode for another.

In summary, the IGLD Project resulted in the formation of the following premise:

The learning-disabled gifted child may experience a disability in a particular performance mode, i.e., visual or auditory encoding of information. As a result of the intellectual capacity and the ability to analyze his/her own information processing ability, the learning-disabled gifted child "alters the processing" of information by developing strategies which use the performance modes in which he/she is stronger to compensate for the weakness in the other performance mode(s). The altered processing frequently allows the learning-disabled gifted child to perform and/or achieve at comparatively higher levels on ability and achievement tests than would average ability children with similar learning disabilities. The compensatory nature of the altered processing would thus make assessment and identification of the learning-disabled gifted child difficult when using standard assessment measures: the altered processing may cause the child to appear not to have learning disabilities according to established definitions and norms.

The exploratory Intellectually Gifted/Learning Disabled Project sought to investigate the nature of learning-disabled gifted children and to raise questions and issues concerning the

definition, identification, and instruction of these children.

It is hoped that the results of the Project will provide a basis for much needed further research and discussion in both the fields of learning disabled and gifted child education.

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Whitmore, J. R. (1980). Giftedness, conflict, and

underachievement. Boston: Allyn and Bacon, Inc.

Whitmore, J. R. (1974). Thinking about my school (TAMS): The

development of an inventory to measure pupil perception of

the elementary school environment. U.S. Department of HEW,

Office of Education, Cooperative Research Project No. 125.

Stanford, CA: Stanford University.

Wiig, E. H., & Semel, E. M. (1976). Language disabilities in

children and adolescents. Columbus, OH: Merrill.

Appendices

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Appendix A

Assessment Information Form

Child's Name _____ Grade _____ CA _____

Parent (Guardian) Name _____ Birthdate _____

Address _____ Telephone _____

School District _____ School Attended: _____

Address _____

School Contact _____

Current Educational Placement/Programming:

____ regular education _____ learning disabilities

____ gifted program _____ tutoring

____ (specify type)

____ other (Please specify if child accelerated, retained)

Test Results

Ability:

WISC-R: _____ date administered _____

VIQ _____ PIQ _____ FSIQ _____

____ Information _____ Picture Completion

____ Similarities _____ Picture Arrangement

____ Arithmetic _____ Block Design

____ Vocabulary _____ Object Assembly

____ Comprehension _____ Coding

____ Digit Span _____ Mazes

Stanford-Binet: _____ date administered _____

____ MA _____ IQ

Language Assessment Tools:

Please specify test title (Peabody, ITPA, ACLC)

Test title _____ date administered _____

Results _____

Test title _____ date administered _____

Results _____

Achievement:

Please report most recent achievement test results
and/or individually administered test results

Test title_____ date administered_____
Composite scores_____ Subtest scores_____

Test title_____ date administered_____
Composite scores_____ Subtest scores_____

Visual-Motor:_____ date administered_____
VMI_____ Bender_____
Other_____

Comments, observations, or test data on the following:

general aptitude_____

general academic ability_____

specific academic ability_____

Other pertinent information related to school performance
such as special interests, exceptionalities, problems,
observational reports, behaviors, attitudes

Test data which the school would like for the KSU team of
school psychologists to obtain:

Special contact person for this child:

Name_____ Telephone_____
Work location_____

Form completed by_____ Telephone_____
Address_____

Appendix B
Parent Interview

Child's name_____	Age_____
Parent(s)_____	Grade_____
Brother(s)_____	Age(s)_____
Sister(s)_____	Age(s)_____

I. Family:

1. Relationship with family members
2. How family communicates
3. What it implicitly values
4. Child's perception of support, concern, interest, pressure of family members

II. Behavior and attitudes

1. Child's acceptance of responsibilities
2. Special interests, activities
3. Early signs of skill development that seemed unusual
Either gifted or LD
4. Child's coping strategies
5. Difficult behavior
certain times
moody, sensitive, temper, destructive
shifts excessively from one activity to another
excessive physical activity
responsive to punishment

III. School

1. School likes and dislikes

Parent Interview

2. Special interests, activities
3. Language skills - development, expressive and receptive vocabulary, reading and comprehension
4. The following as related to school work
 - concentration
 - organization (time and work)
 - independence
 - listening
 - task completion

IV. Social/emotional

1. Accurate perceptions of social situations-peers
adults
2. Aggressive - withdrawn
3. Disturbs or bothers other children
4. Difficulty making and/or keeping friends
5. Trouble accepting authority figures

V. Strengths and Weaknesses

1. Child's perception of giftedness and LD interaction
Parent's perception of giftedness and LD
interaction
2. Where is child in relation to "normal development"
in the academic setting
in a social setting (peers)
3. List strengths and weaknesses

Appendix C

Characteristic Language Behaviors

Check, if present:

- [] 1. Can define and explain words.
- [] 2. Anticipates closure in conversation of others.
- [] 3. Language is socially useful.
- [] 4. Language is grammatically correct.
- [] 5. Uses fairly long sentences, i.e., compounds and complex sentences.
- [] 6. Tells a rather connected story about an event, demonstrating relationships between persons, places, etc.
- [] 7. Handles opposite analogies easily, e.g., flies-swims, blunt-sharp, sweet-sour.
- [] 8. Follows fairly complex directions with little repetition.
- [] 9. Converses at rather adult level.
- [] 10. Uses social amenities appropriately.

Language Use

- [] 11. To satisfy needs or desires, e.g., "I need a pencil."
- [] 12. To control behavior of other people, e.g., "Give me that book."
- [] 13. To participate in the "give and take" of social discourse, to establish and define social relationships, e.g., "let's..., you and I can...."
- [] 14. To express one's individuality, give personal opinions and feelings.

- [] 15. To express fantasies, create an imaginary world.
- [] 16. To find out about things, ask questions, seek information.
- [] 17. To give information about the world s/he has experienced.
- [] 18. To formulate or construct ideas from new or old
information.
- [] 19. To present information in relation to sender-receiver
level of social discourse and context.
- [] 20. To demonstrate knowledge and use of conventional rituals,
e.g., "hello, uh-huh, etc."

Appendix D

Annotated Bibliography

Learning-Disabled Gifted Children

The articles annotated here are of varying degrees of quality and appropriateness to the field of learning-disabled gifted, however, all were cited or referenced in other articles or bibliographies pertaining to the field. The chapters from the Fox, et al., (1983) book on learning-disabled gifted children have been annotated separately. The Fox book is the best source of information for the field of learning-disabled gifted, but the chapters vary greatly in quality and information so this author felt it worthwhile to separate them so the user of the bibliography could select those most appropriate to their reading.

Asterisked (*) materials are those the author considers the best of those reviewed.

Alvino, J., & Weiler, J. (1979). How standardized testing fails to identify the gifted and what teachers can do about it. Phi Delta Kappan, 106-109.

States that standardized tests often handicap intellectually gifted children and prevent them from being identified; as many as 50% of all gifted children go unidentified if group tests alone are used. Questions whether standardized testing really only reinforces those

models of learning and intelligence susceptible to easy measurement. Suggest teachers employ a post-test discussion with students to elicit the students' test answer rationale. Article includes a series of questions for eliciting responses.

- *Baldwin, L. J., & Garguilo, D. A. (1983). A model program for elementary-age learning-disabled/gifted youngsters. In L. H. Fox, L. Brody, & D. Tobin (Eds.), Learning-disabled/gifted children: Identification and programming (pp. 207-221). Baltimore, MD: College Park Press.

Describes a self-contained program for learning-disabled gifted children in Southern Westchester County, New York which combines traditional approaches for learning disabilities and gifted to create an optimal setting for the learning-disabled gifted child. Describes the identification system, program goals, and instructional strategies designed to meet the dual characteristics of each exceptionality. Good synthesis of the two teaching methods into one approach appropriate for the learning-disabled gifted child.

- Baum, S. (1984). Meeting the needs of learning disabled gifted students. Roeper Review, 7, 16-19.

Three brief case studies of learning-disabled gifted boys. States that the dichotomy of learning behaviors in learning-disabled gifted may lead to severe behavior

problems, depression, or lack of effort in school.

Proposes Enrichment Triad Model (Renzulli) to meet needs of learning-disabled gifted children and Revolving Door (Renzulli) as an identification model (also states that one must document that somewhere in child's life learning-disabled gifted child possesses Renzulli's three characteristics).

*Berk, R. A. (1983). Learning disabilities as a category of underachievement. In L. H. Fox, L. Brody, & D. Tobin (Eds.), Learning-disabled/gifted children: Identification and programming (pp. 51-76). Baltimore, MD: College Park Press.

Article deals exclusively with definition of learning disabilities. Discusses the five functional characteristics in most definitions, elements of inclusion, elements of exclusion, difference between theoretical and operational definitions. States that most definitions of learning disabilities are theoretical that have become operationalized - the ability/achievement discrepancy has become a primary element in operationalized definitions, therefore author believes learning disabilities has become a category of underachievement. An excellent critical review of the definitions of learning disabilities.

Bricklin, P. M. (1983). Working with parents of learning-disabled/gifted children. In L. H. Fox, L. Brody, & D.

Tobin (Eds.), Learning-disabled/gifted children: Identification and programming (pp. 243-260). Baltimore, MD: College Park Press.

States that parenting patterns and home environments are critical factors in the development of society's greatest achievers. Gives general information about parenting and parental/family influence on child development. Also gives parent intervention models and describes in detail an integrated parent intervention model.

Daniels, P. R. (1983). Teaching the gifted/learning disabled child. Rockville, MD: Aspen Systems Corporation.

After a brief introduction to the characteristics and identification of gifted/learning disabled children, the author describes teaching techniques to use with these children. These techniques are explained in a series of units: Remediation Procedures Unit, Specific Abilities Unit, Written Language Unit, Supportive Aspects Unit.

Daniels, P. R. (1983). Teaching the learning-disabled/gifted child. In L. H. Fox, L. Brody, & D. Tobin (Eds.), Learning-disabled/gifted children: Identification and programming (pp. 153-169). Baltimore, MD: College Park Press.

Discusses needed changes which must begin at the administrative level in local school districts for needs of

learning-disabled gifted children to be met: placement of children, teacher characteristics, related services.

Advocates learning-disabled gifted children being grouped together at least part of the school day. Author does not feel conventional remedial programs will work and does not advocate placement of learning-disabled gifted in regular learning disabilities classes.

Eklind, J. (1973). The gifted child with learning disabilities. Gifted Child Quarterly, 17, 96-97, 115.

Article deals with basic identification of learning-disabled gifted children with some suggestions for instruction. States that learning-disabled gifted children perform extremely poorly on group tests and feels it is critical that these children be given individually administered tests. Recommends ITPA to pinpoint areas of learning disabilities and suggests that a battery of tests is most useful in establishing a differential diagnosis of learning-disabled gifted. Suggests instruction should capitalize on strong modalities while at same time strengthening weak modalities.

*Fox, L. H. (1983). Gifted students with reading problems. In L. H. Fox, L. Brody, & D. Tobin (Eds.), Learning-disabled/gifted children: Identification and programming (pp. 117-149). Baltimore, MD: College Park Press.

Describes research efforts into the problems of

identification of the learning-disabled gifted child. Study screened data on 17,000 students at Temple University Reading Clinic. Article provides an analysis of data regarding students identified as gifted in that population. Concludes that learning-disabled gifted children do exist and that it seems likely that the vast majority of them are unrecognized because their disability is not severe enough for performance to be noticeably below grade level. One of the few studies of any depth to be found in the literature regarding learning-disabled gifted children. Raises a lot of good questions about the identification and characteristics of learning-disabled gifted children.

*Fox, L. H., & Brody, L. (1983). Models for identifying giftedness: Issues related to the learning-disabled child. In L. H. Fox, L. Brody, & D. Tobin (Eds.), Learning-disabled/gifted children: Identification and programming (pp. 101-116). Baltimore, MD: College Park Press.

Discusses various definitions of gifted and learning disabilities - conceptual, legal, and operational and determines that the concept of learning-disabled gifted is viable according to some definitions but not others.

Discusses various tests and other measures for use in identifying learning-disabled gifted children. Concludes that the most defensible approach to identification of learning-disabled gifted children is the use of a variety

of psychometric and nonpsychometric measures for initial screening to identify a pattern of strengths and weaknesses. Good summary of major tests used in the identification process and analysis of their appropriateness for use in the identification of learning-disabled gifted children.

- *Fox, L. H., Brody, L., & Tobin, D. (1983). Learning-disabled/gifted children: Identification and programming. Baltimore, MD: College Park Press.

Gives background information about learning-disabled gifted children and documents the results of a three year research project on the learning-disabled gifted child at Johns Hopkins University.

- *Fox, L. H., Tobin, D., & Schiffman, G. B. (1983). Adaptive methods and techniques for learning-disabled/gifted children. In L. H. Fox, L. Brody, & D. Tobin (Eds.), Learning-disabled/gifted children: Identification and programming (pp. 183-193). Baltimore, MD: College Park Press.

Authors suggest adaptive techniques for learning-disabled gifted child to enable the child to participate in programs designed for the gifted. States that the problem for these children is not that they cannot acquire knowledge or demonstrate its acquisition, but that they cannot do so within the framework of activities designed by

the school. Suggests specific adaptive techniques for reading, writing, math, life. Excellent article.

*French, J. N. (1982). The gifted learning disabled child: A challenge and some suggestions. Roeper Review, 4 (3), 19-23.

Case study of a nine year old learning-disabled gifted boy. Describes identification, and instructional approach. Very detailed case study compared to others in the field.

*Gallagher, J. J. (1983). The adaptation of gifted programming for learning disabled students. In L. H. Fox, L. Brody, & D. Tobin (Eds.), Learning-disabled/gifted children: Identification and programming (pp. 171-181). Baltimore, MD: College Park Press.

Author feels it is possible to insert learning disabilities specialized instruction into gifted programs - he feels both fields can benefit the child. Stresses the need for careful diagnosis and planning for each individual child and the need for counseling with parents of the learning-disabled gifted child. Gives overview of both fields. Good, short overview of the fields - especially theories, definitions, and strategies for children with learning disabilities.

Gowan, J. C., & Bruch, C. B. (1971). The academically talented student and guidance. Boston: Houghton-Mifflin.

Refers to learning-disabled gifted (pp. 54-55)

briefly. Emphasizes very individualized programming based on careful diagnosis. Describes child as having uneven patterns of abilities ("differential abilities") and as being especially hampered by extreme sensitivity to and guilt regarding the discrepancies within themselves.

Karnes, M. B., & Bertschi, J. D. (1978). Identifying and educating gifted/talented nonhandicapped and handicapped preschoolers. Teaching Exceptional Children, 10, 114-119.

Describes the RPYHT program at the University of Illinois. Gives details of the identification process, which continues throughout the intervention period, and the two classroom approaches used in the program, Open Classroom and SOI.

Lewis, M. E. B., & Daniels, P. R. (1983). Teacher training in the clinical method for learning-disabled/gifted children. In L. H. Fox, L. Brody, and D. Tobin (Eds.), Learning-disabled/gifted children: Identification and programming (pp. 261-273). Baltimore, MD: College Park Press.

Explains the role of clinical education and the clinical educator, describes qualification for clinical educator. Describes use of clinical diagnostic-prescriptive approach to learning-disabled gifted children in program at Kennedy Institute School.

*Maker, C. J. (1977). Providing programs for the gifted handicapped. Reston, VA: Council for Exceptional Children.

This is the often-quoted "bible" of gifted handicapped education. An excellent reference.

Meeker, M. (1967). Creative experiences for the educationally and neurologically handicapped who are gifted. Gifted Child Quarterly, 11, 160-164.

Describes classes in some California schools for children with obtained measured discrepancy between ability and achievement. Describes exploding IQ concept into its composites by means of Meeker's 1963 templates to allow for accurate diagnosis of deficits and strengths. Suggests that teachers develop creative activities centered around problem areas.

Meisgeier, C., Meisgeier, C., & Werblo, D. (1978). Factors compounding the handicapping of some gifted children. Gifted Child Quarterly, 22, 325-331.

General discussion of topic. Authors point out need for more careful evaluation of handicapped, individualization of each child's school program.

Osman, B. B. (1982). No one to play with: The social side of learning disabilities. New York: Random House.

Chapter Six in this book deals with the learning-disabled gifted child. Emphasis on the social problems of the child - social ineptness, lack of belonging. States that learning-disabled gifted children usually make excellent progress due to their sensitivity and advanced

level of understanding. Gives case study examples. Easy, interesting reading. Good information regarding social disabilities of learning-disabled gifted children.

Pendarvis, E. D., & Grossi, J. A. (1980). Designing and operating programs for the gifted and talented handicapped. In J. B. Jordan & J. A. Grossi (Eds.), An administrator's handbook on designing programs for the gifted and talented (pp. 66-88). Reston, VA: Council for Exceptional Children.

Author feels there is sufficient knowledge base to support the development and implementation of programs for the gifted/ handicapped. Gives a sample policy statement for gifted handicapped education, suggests methods for identification, suggests instructional programs, gives sample IEP.

Pledgie, T. K. (1982). Giftedness among handicapped children: Identification and programming development. Journal of Special Education, 16, 221-227.

Lists three tasks necessary to achieve the goal of identifying and serving gifted/handicapped children: staff sensitivity, identification (by qualified personnel experienced in evaluating gifted/handicapped), and transdisciplinary approach to programming. "Major new element" in identification, Teacher Observational Items (TOI) introduced.

Rosenberg, H. E., & Ehrgott, R. H. (1973). Performance contracting, programmed learning and behavior modification may inhibit learning of the gifted. Gifted Child Quarterly, 17, 254-259.

Discusses reinforcement aspects of Skinnerian techniques. States that programmed materials increase the boredom of gifted students and that in rapid learners motivation is highest when the probability of success is only moderate.

Rosner, S. L. (1983). Diagnosis: A case-typing approach. In L. H. Fox, L. Brody, & D. Tobin (Eds.), Learning-disabled/gifted children: Identification and programming (pp. 141-149). Baltimore, MD: College Park Press.

Summarizes a case study approach and the specific form as used with a learning-disabled gifted child.

*Rosner, S. L., & Seymour, J. (1983). The gifted child with a learning disability. In L. H. Fox, L. Brody, & D. Tobin (Eds.), Learning-disabled/gifted children: Identification and programming (pp. 77-79). Baltimore, MD: College Park Press.

Authors advocate individual case study approach to defining learning disabilities and gifted, and stress the importance of using a battery of measures, a thorough open-ended case history interview and a feedback interview. Discusses typical characteristic type of responses to

WISC-R, defenses frequently used by learning-disabled gifted children. Gives case studies to support ideas.

*Schiff, M. M., Kaufman, A. S., & Kaufman, N. L. (1981). Scatter analysis of WISC-R profiles for learning disabled children with superior intelligence. Journal of Learning Disabilities, 14, 400-404.

Describes study involving 30 children in which WISC-R's were analyzed. Conclusions point out the areas of weakness for learning-disabled gifted children to be identical to those of reading disabled and learning disabled children (Arithmetic, Coding, Digit Span), Verbal-Performance discrepancy meaningfully larger than normal or learning disabled child, extreme amount of subtest scatter. Children exhibited excellent verbal comprehension and expression skills, many creative talents. Evidenced weaknesses in cognitive area of sequencing, in motor coordination activities, in emotional development. "In many ways the emotional concomitants of these learning disabled children seem striking in their severity and were apparently more exaggerated in the pervasiveness of their impact than is typical for conventional learning disabled populations. Good analysis - one of the few in the field.

Sellin, D. F., & Birch, J. W. (1981). Psychoeducational development of gifted and talented learners. Rockville, MD: Aspen Systems.

Pages 90-111 deal with the gifted handicapped. Based mainly on Maker (1977) with author's own extrapolated tables from Maker's work.

Senf, G. M. (1983). The nature and identification of learning disabilities and their relationship to the gifted child. In L. H. Fox, L. Brody, & D. Tobin (Eds.), Learning-disabled/gifted children: Identification and programming (pp. 37-49). Baltimore, MD: College Park Press.

Author makes a distinction between public school conception of learning disabilities and the clinical conception. Describes the "extraordinary" psychometric difficulties which prohibit the school psychologist from finding the learning-disabled gifted child. Wants "related disciplines" on regular contractual or salaried basis in public education to better identify learning-disabled gifted.

Stefanich, G., & Schnur, J. O. (1980). Identifying the handicapped-gifted child. Science and Children, 17, 18-19.

Discusses the most often used criteria for identification of a child as gifted and how they discriminate against the handicapped. Gives suggestions for identifying the gifted/handicapped.

*Tannebaum, A. J., & Baldwin, L. J. (1983). Giftedness and learning disability. In L. H. Fox, L. Brody, & D. Tobin (Eds.), Learning-disabled/gifted children: Identification

and programming (pp. 11-36). Baltimore, MD: College Park Press.

Discusses Tannenbaum's theory of giftedness and then describes learning-disabled gifted and suggests ways to identify such children. Stresses need for special "hybrid" teacher.

Tobin, D., & Schiffman, G. B. (1983). Computer technology for learning-disabled/gifted students. In L. H. Fox, L. Brody, & D. Tobin (Eds.), Learning-disabled/gifted children: Identification and programming (pp. 195-206). Baltimore, MD: College Park Press.

Extolls the advantages of computers in schools for learning disabled and learning-disabled gifted children and explains how they can be used in those settings. Describes experimental program for learning-disabled gifted children in which microcomputer instruction was one aspect of the program.

*Udall, A. J., & Maker, C. J. (1983). A pilot program for elementary-age learning-disabled/gifted students. In L. H. Fox, L. Brody, & D. Tobin (Eds.), Learning disabled/gifted children: Identification and programming (pp. 223-242). Baltimore, MD: College Park Press.

Describes a program for learning-disabled gifted children in Tucson Unified School District. One of the few articles that operationally defines learning-disabled

gifted. Good section on referral process. Excellent, specific information regarding the learning-disabled gifted.

*Whitmore, J. R. (1980). Giftedness, conflict, and underachievement. Boston, MA: Allyn and Bacon.

Excellent reference for all areas of underachieving gifted students, including learning-disabled gifted.

Whitmore, J. R., & Maker, C. J. (in press). Intellectual giftedness in disabled persons. Rockville, MD: Aspen Systems Corporation.